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THE BIRDS OF THE ISLAND OF CARRIACOU.

BY JOHN GRANT WELLS.

Part II. Land Birds.

(*Concluded from p. 247.*)

47. **Columba corensis** *Gmel.* RAMIER.— This beautiful pigeon is our finest game bird, and is much sought after by sportsmen. They are numerous, and breed in numbers on the small islets; a few nest at Chapeau Carré and that vicinity. They are capable of being tamed if taken from the nest when fledged and fed by the hand until they are able to pick up food for themselves, when they can be kept like ordinary pigeons. A remarkable feature is that in the wild state the Ramier is exclusively a frugivorous bird, but the tame ones, raised on Indian corn, will not take fruit, though freshly picked and given to them. In Grenada the Ramier is principally confined to the 'high woods,' but in Carriacou they are found all over the island, from the grape trees on the beach to High North. Several spots are favorite resorts of these birds where good shooting can be obtained, notably Dumfries Gully, Belair Ridge, and Quarry Road. I have shot many on an 'acoumar' tree in Belair village surrounded by dwelling houses, and at Hermitage they can be shot from the door step as they fly to and fro, at certain seasons, to their feeding grounds. The nest is generally placed on the outspreading branches of the seaside grape tree or on a mangrove tree. It is composed of a few dry sticks, hollowed in the middle by the weight of the bird; the eggs are two, pure white, and of the size of those of the domestic pigeon.

48. **Zenaida martinicana** *Bonap.* *Zenaida castanea* (Wagl.). TOURTERELLE; SEASIDE DOVE; WILD PIGEON.— This dove is quite numerous

all round the island though it is seldom seen on the highest hills; it is a ground pigeon, feeding on 'pigeon peas' and fallen berries and seeds, though it may also be found eating the gomier and acoumar fruit. They are excellent for the table, and consequently large numbers are shot; the peasants catch scores in traps and snares and they are taken to Grenada for sale. They nest on the cliffs near the sea and also on the small islands; the nest is only a few dry sticks, generally placed in a sea-side grape tree. I have found some of their eggs laid in a tuft of grass on the ground. The eggs are white, and two in number.

49. **Zenaida rubripes** *Lawr.* TRINIDAD GROUND DOVE; MOUNTAIN DOVE.—This beautiful little dove occurs in numbers. Unlike the other members of the dove family, it is found in flocks of 6 to 15. It feeds on the seeds of grasses and shrubs, and when flushed from its feeding grounds generally flies a short distance and alights in a tree. I have counted as many as thirty-three perched together on an accacia tree. Harvey Vale and Beausejour pastures are favorite resorts of these birds. They are very swift on the wing, and it needs a quick eye to shoot many of them, and owing to their close plumage they 'carry away' a deal of shot. I have known one of these birds to drop nearly half a mile off after being hit. The eggs are two, pure white; the nest is placed in the accacia bushes and on the islets.

50. **Columbigallina passerina** (*Linn.*). GROUND DOVE; 'ORTOLAN.'—This pretty little dove is very abundant all over the island, the pastures and seed bearing grasses and shrubs being conducive to its welfare. They are fond of newly cleared land, and may be found in pairs on the roads, especially after they have been repaired.

The nest is a rude structure of dried stalks and grass, generally found in a short stump or low shrub, in which are laid two pure white eggs, measuring .85 × .60.

51. **Falco columbarius** *Linn.* PIGEON HAWK.—This is a migrant, and arrives about the same time as the different species of Scolopacidæ, on which they prey.

52. **Pandion haliaëtus carolinensis** (*Gmel.*). OSPREY; FISH HAWK.—A migrant which visits the island regularly every year; it is generally seen in August and remains until February and March. It frequents the bays around the coast; seldom more than one is seen at a time.

53. **Coccyzus americanus** (*Linn.*). AMERICAN CUCKOO.—This bird is new to our avifauna; I never saw it or heard of its being seen until the year 1896, when I saw a pair in Grand Anse pasture, the male of which I shot. Since then I have seen them every year, about October and November; it is a migrant.

54. **Coccyzus minor** (*Gmel.*). CUCKOO MANIOC; RAIN-BIRD.—A lazy and foolish looking bird, it creeps along the branches of a tree, and will take a short flight if alarmed. It feeds on crickets and other insects. Its note is a harsh grating sound which the peasants say is its "calling for rain." The nest is difficult to find, being usually placed in a tree covered with liannes. The eggs are pale green.

55. **Crotophaga ani** *Linn.* CORBEAU; TICK BIRD. — Not numerous in Carriacou; small flocks may be met with in the pastures where cattle are feeding, and they are often seen in the grass by the roadside hunting for crickets, their keel-shaped bill being admirably adapted to separating the blades of grass and starting the crickets which are then pounced upon.

The nesting habits of this bird are peculiar. I have not been able to determine how many eggs are laid by each bird, as they use one large nest in common. A flat nest is first built and about 6 or 7 eggs laid in it; then these are covered over and more eggs laid, and so on until four or five layers of nests have been constructed one over the other. I have seen four of these birds sitting on the nest together. When the top layer of eggs is hatched, and the young fledged, it is scraped off and incubation goes on with each succeeding layer, until all the eggs are hatched. The eggs are of a light green when newly laid, but they soon become coated with a chalky substance, which gets stained and scratched, giving them a dirty appearance. They measure 1.28 × 1.04.

56. **Ceryle alcyon** (*Linn.*). BELTED KINGFISHER. — This interesting migrant visits the island about August, and may be found in pairs frequenting the manchineel trees along the shore. They generally perch on a twig overhanging the sea, from which they plunge and take their finny prey. When flying from one tree to another, or when alarmed, they utter a prolonged *churr*.

57. **Eulampis holosericeus** (*Linn.*). GREEN HUMMINGBIRD. — Not numerous; generally seen in pairs. Its nest, usually 'saddled' on a large tree limb, is a beautiful and compact structure. The two eggs are pure white.

58. **Bellona cristata** (*Linn.*). CRESTED HUMMINGBIRD; COLIBRI. — This diminutive bird is one of the most pugnacious known here; it will attack any bird that approaches its nest. I have seen it drive off a hawk by perching on its head and pecking at its eyes. They have many battles with each other, especially when several of them congregate over a tree covered with blossoms. At such times their motions are so quick that the eye can hardly follow them, but the whirring of the wings and clashing of the beaks tell the fury of the combat. The nest is usually built on the drooping branches of the tamarind tree, or on roots under the banks of the road. In the Parish Church in Hillsborough a pair of these birds have built their nest on the rope suspending a chandelier and reared their young for several years. I have also seen a nest built on a long nail in the wall of a house in Hillsborough. The nests are beautiful little structures, sometimes constructed of fine mosses, but those built of cotton wool and covered outside with spiders' web and fine bark are exquisite. They lay two diminutive white eggs.

59. **Milvulus tyrannus** (*Linn.*). SCISSORTAIL; FORK-TAIL FLYCATCHER. — This is a migrant, arriving in August in considerable numbers. It frequents the pastures near the seashore, and preys upon the

winged insects which swarm about the rain-pools and swamps. It inflicts punishment on the sandpipers and other small birds, attacking them with its strong bill and opening and shutting its tail feathers like a pair of shears. Like most of the family of Flycatchers, this bird has on its head a crest of bright crimson and yellow feathers which is concealed except when excited or in chase of its prey.

60. **Tyrannus rostratus** (*Scl.*). PIPPIREE. — This bold and dashing bird may often be seen perched at the top of some dry tree on the lookout for flying ants and other insects on which it feeds. It darts out on its prey in the air, turning and twisting about with ease, and the snapping of its strong bill can be heard as it closes over the capture. It also frequents the ponds and pools, where, skimming along the surface, it captures dragon-flies, etc. They show great courage in defending their nests and will peck at the eyes and hands of anyone climbing the tree on which the nest is situated; dogs passing near the tree are vigorously attacked, and pigs seem to be most obnoxious to them. In the early morning its shrill note is heard, *pip-pi-ree*, repeated often in quick succession.

It nests generally in the white cedar trees and also on the hog plum; the nest is loosely formed of dry tendrils and midribs of leaves; there is no soft lining for the eggs, though the shallow cup in the centre is usually of finer material. The eggs are three, reddish buff handsomely marked with spots and blotches of red-brown and dark gray; they measure 1.15 × .75.

61. **Myiarchus oberi** *Lawr.* PIPPIREE-GROS-TETE.— This bird is not abundant. It has a foolish appearance, and will remain perched on a twig for several minutes muttering its call note *pleet, pleet.* It nests in holes in trees, the nest being usually composed of horse hair, bits of rag, rotten wood, etc. The eggs are three and sometimes four in number, of a light buff color thickly scribbled over and blotched with brownish purple; they measure .96 × .70.

62. **Elainea martinica** (*Linn.*). TOP-KNOT PIPPIREE.— This is an active and lively little bird; its note may be heard from five o'clock in the morning and seems to say *Ladies-Ladies-Ladies-your-lazy.* It is quick in its movements when darting after insects on the wing or flitting from branch to branch.

It builds a beautiful little nest, usually in the fork of a branch, and sometimes 'saddled' on a large limb, in shape like a shallow cup about 3 inches in diameter and 1 inch deep. It is composed outwardly of skeleton leaves interwoven with cobwebs and cotton wool; it is lined with fine tendrils and feathers. It lays two eggs, pale buff with a pink tinge and a circle of brown and purple spots round the blunt end; they measure .80 × .64.

63. **Quiscalus luminosus** *Lawr.* BLACK BIRD; MERLE. — Numerous all over the island, this bird does good service among the sheep and oxen by picking off the ticks that infest them; but they are detested by the peasants for robbing the cornfield. They will dig up the grains of maize

when planted, eat the sprouts as they come up, and also feast upon the young ears, uttering all the while their cry of *green-corn-sweet.* They are gregarious, large numbers being often seen together. A tree with thick foliage is usually chosen for roosting, the mango tree being often selected. Hundreds of them may be seen flying to one of these trees at dusk, and the noise made by them before settling down is nearly deafening.

Everything eatable seems to be food for this bird, and it is certainly an impudent thief. I have seen it watching the vendors of cakes in the market place, and as one of them leaves the tray for a while, down swoops the blackbird and helps himself to a bun or other choice bit. He will hop about the counter of the butcher's stall and snatch up scraps of meat as they fly from the chopper. It eats grain, ground nuts, fruit, and also robs the nests of other birds of the newly hatched young which it devours. When the Indian corn is being planted little urchins are kept in the fields all day knocking two bits of iron together, pelting the blackbirds with stones, and roundly abusing them both in words and song.

In spite of his sins this is a showy bird. It is striking to see the male strutting about with the sun reflected on the beautiful purple-black of its neck and wings, cocking up its boat-shaped tail every now and then. The female is of a sober brown color. They nest in colonies, several nests being placed on the same tree. The nests are usually composed of dry roots and coarse straw well plastered with cow dung. The eggs are three and sometimes four, of a light blue, scribbled and blotched all over with purple and black; they measure 1.02 × .76 to 1.00 × .72.

64. **Molothrus atronitens.** COWBIRD.—This bird was not observed until June, 1899, when flocks of six to ten were to be seen about Hermitage and Harvey Vale pastures. I believe it to be a migrant, though a few stragglers are seen all the year round.

65. **Tiaris bicolor** (*Linn.*). SEE-SEE ZERBE; BLACK-FACED SEED-EATER.—Abundant all over the island is this sober colored little quit. It feeds on the seeds of grasses. It builds a domed nest when placed in a shrub or in the roots of trees on the roadsides, but when built inside of a house it takes the shape of the angle between two joists. Several of them nest inside the church in Hillsborough; one pair built in a hanging lamp there and reared its young. In the court house a pair of these birds have reared two broods for several seasons in a nest placed in a 'sea fan' which stands on a shelf. The eggs are three in number, dull white, with reddish brown spots, confluent at the blunt end; they measure .59 × .48.

66. **Progne dominicensis** (*Gmel.*). PURPLE SWALLOW.—Flocks of these birds may be seen hovering about over the fields and pastures capturing winged insects, especially after a morning shower. About noon they roost in numbers on some dry tree, or in the upper branches of the silk cotton tree. They nest in holes in the cliffs and in the walls of abandoned sugar works.

67. **Hirundo erythrogaster** (*Bodd.*). RUFOUS-BELLIED SWALLOW.—

This migrant appears in August when large flocks may be seen near the sea coast, darting about, and occasionally resting on a dry twig. They disappear in November and December.

68. **Vireo calidris** (*Linn.*). BASTARD GRIEVE.— In the early mornings, notably in the months of April and May, the note of this bird is heard repeated energetically every few seconds, *Sweet, too sweet, not-too-sweet,* as it creeps along the branches of the tamarind trees. It is a shy bird and yet inquisitve, as it will come quietly to the end of a branch to peep at anyone standing under the tree, and on the least motion being made by the person, it makes off quickly. Its food is principally insects, but it also eats a small red berry, the fruit of a wild shrub. It is pretty well distributed all over the island. It builds a pensile nest, usually in the fork of a small twig, and sometimes suspended between two twigs, very compactly formed of dried grasses and fine tendrils intermixed with cotton wool. In shape the nest is like a deep teacup. The three eggs are white, with a few scattered spots of dark brown, and measure .88 × .60.

69. **Cœreba saccharina** (*Lawr.*). SUCRIER; YELLOW SEE-SEE.— This pretty little bird is numerous in Carriacou, and may be seen wherever there are blossoms, it being fond of the insects found in the petals; it also is partial to the fruit of the prickly pear. It nests both in trees and in houses, the nests built outside are dome-shaped, those inside are generally built to suit a space between two beams or flat on the sill. The church in Hillsborough is a favorite nesting place of this bird. I have seen a pair busily engaged building a nest on a chandelier in the church whilst divine service was being held and over 500 persons were in the building. A pair built a nest and reared their young in a tethering chain hung up for sale in one of the shops in Hillsborough. I might cite many other queer nesting places.

On a window sill in my office, a goblet of water is placed every day to cool; a pair of these birds seem to consider it is put there for their sole use and benefit; they will perch on the rim, take a drink, and then proceed to have a bath, and sprinkle the water about.

The eggs are three in number, of a dull white thickly spotted with brown.

70. **Seiurus nævius** (*Bodd.*). WATER THRUSH.— On the outskirts of the mangrove swamps this lively little bird may be seen, hopping about and flicking its tail up, uttering at the same time its note *tseep, tseep.* It is a migrant, though I have observed one or two all the year round.

71. **Mimus gilvus** (*Vieill.*). MOCKINGBIRD; PIED CARREAU. — The conditions of this island seem particularly to suit this bird, as it is found in profusion; in fact, it is the commonest bird here. Everywhere its song may be heard, always varying and ever delightful. Its notes may be heard at intervals on moonlight nights, which has gained for it the name of the West Indian Nightingale. It feeds on both fruit and insects, and is very partial to the berry of the black sage. It has been accused of eating the eggs of other birds, but of this I have no personal knowledge. It nests

everywhere, the accacia trees being often selected. The nest is usually a rude platform of dried twigs, with a round depression in the middle lined with fine roots, etc.; in this are laid three eggs, which vary considerably in color and marking; clutches are rarely found to be alike. The general color is pale green, spotted and blotched with brown; they measure 1.06 × .74.

72. **Merula gymnopthalma** (*Caban.*). YELLOW-EYED GRIEVE; THRUSH. — Not numerous; frequents the mango and other thick-leaved trees. Its notes, heard in the mornings, are very musical and varied; one note in particular is a liquid metallic tinkle. The nest is usually composed of dry roots and mud with no soft lining; the eggs are three in number, pale green thickly spotted with brown, and measure 1.06 × .80.

73. **Margarops albiventris** (*Lawr.*). SPOTTED THRUSH. — This bird was not seen here until after the terrible hurricane which devastated the neighboring Island of St. Vincent on 11 September, 1898, when numbers of them arrived, and it may now be considered as resident.

A NEW LONG-BILLED MARSH WREN FROM EASTERN NORTH AMERICA.

BY OUTRAM BANGS.

AT PRESENT there are confused under the name *Cistothorus palustris* (Wilson) two quite distinct birds; one, true *C. palustris*, breeding in the salt and brackish marshes of the Atlantic coast from Connecticut southward; the other inhabiting the inland fresh-water marshes and extending north to Massachusetts, Ontario and southern Manitoba. The former, a small bird, has the chin, throat and belly pure white and the breast is usually white also, though sometimes faintly clouded with pale brownish, with the rump, upper tail-coverts and scapulars dusky brown. The latter is a decidedly larger form, in which the chin, throat and belly are buffy or brownish white, the breast much more distinctly clouded with brownish and the rump, upper tail-coverts and scapulars reddish brown.

My attention was first called to the differences between these two Marsh Wrens by a series of winter specimens sent me by Mr. Arthur T. Wayne of Mount Pleasant, S. C. Familiar with the

fresh-water bird from my earliest collecting days, I at once recognized a stranger in the little white-bellied, dark-backed form that winters in the coastal marshes of South Carolina. Since then, with the help of Mr. Wm. Brewster's large series and what other specimens could be borrowed, I have worked out the distribution of the two, and find the little white-bellied form to be peculiar to the salt marshes of the coast and the larger brownish-bellied bird to be restricted, in the breeding season, to the fresh-water marshes of the Atlantic watershed.

Certhia palustris Wilson was unequivocally based on the small white-bellied form, and the larger bird of the fresh marshes is the one in need of a name.

As with all Long-billed Marsh Wrens, there is some individual variation in color in both the eastern races; thus occasionally a bird taken in the breeding season in the salt marshes of Connecticut, or southward, will not be so white below as usual, or another will have the lower back rather redder than it ought; now and then, also, a bird from the fresh-water marshes of Massachusetts or elsewhere will slightly approach in color to true *C. palustris;* but size is an infallible test, and these slightly off color examples will always be found to agree in this respect with the more typical specimens of their own race. Were it not for this individual variation in color, rare as it is, I should unhesitatingly pronounce the two birds here treated distinct species, so sharply are their habitats defined, and so great is the difference in size between them.

From either of the western races, *Cistothorus palustris paludicola* Baird or *C. palustris plesius* Oberholser, the eastern forms can be told by many slight, though pretty constant characters as pointed out by Mr. Oberholser.[1]

South of the range of true *C. palustris* and living under much the same conditions, the salt marsh of the coast, a very different bird — *C. griseus* Brewster — occurs. I can find no sign of intergradation between these two and most emphatically regard the latter as a distinct species. This bird breeds and is resident from the coast of South Carolina to Matanzas Inlet, Florida. At

[1] Auk, Vol. XIV, April, 1897, pp. 186–196. 'Critical Remarks on *Cistothorus palustris* (Wils.) and its Western Allies.' By Harry C. Oberholser.

St. Marys, Ga., I became very familiar with it. In early April the males were in full song and nest building had just begun, the great salt marsh teemed with them and their cheerful little songs could be heard everywhere. One peculiarity of *C. griseus* is that it sings low down in the grass wholly out of sight, whereas *C. palustris* usually sings from a high stalk in plain view above the marsh. At Mount Pleasant, S. C., *C. griseus* is the breeding form — much rarer now than formerly owing to severe storms of a few winters ago — and true *C. palustris* winters there in numbers, but in spring retires northward to breed. Mr. Wayne occasionally gets also in winter an individual or two of the new form here described, which is very easily told at this time of year from either of the others.

The two forms of Long-billed Marsh Wrens, hitherto confused under the name *Cistothorus palustris*, can, I think, be recognized by the following brief diagnoses. Care must always be taken, however, in identifying specimens, that one has properly sexed specimens, as females are much smaller than males, and wrongly sexed skins (unfortunately too frequent even when made by good collectors) are confusing. In autumnal plumage the color differences between the two races are exaggerated and thus winter and autumn specimens are easiest to tell apart. In worn mid-summer plumage the difference in the color of the back is not so noticeable, but even then the much whiter underparts of true *C. palustris* is a strong color character. The difference in size is always constant, true *C. palustris* being a much smaller bird in every way — wing, tail, tarsus and bill — than its neighbor of the fresh-water marshes.

Cistothorus (Telmatodytes) palustris palustris (*Wils.*).

Type locality: Tidal marshes of the Pennsylvania rivers.[1]
Distribution: Salt and brackish marshes of Atlantic coast from Con-

[1] Wilson did not give a definite type locality for his *Certhia palustris*, saying, "It arrives in Pennsylvania about the middle of May, or as soon as the reeds and a species of nymphea, usually called splatter-docks, which grow in great luxuriance along the tide water of our rivers are sufficiently high to shelter it."

necticut southward to Maryland and Virginia; in winter to coast of South Carolina.

Characters: Size small: in ♂, wing 47 to 48 mm.; tail, 40.5 to 41.5; tarsus, 17.5 to 18; exposed culmen, 14 to 15; in ♀, wing, 43.5 to 46; tail, 35.6 to 38; tarsus, 17 to 17.5; exposed culmen, 13.5 to 14; bill slender in proportion. Pale areas of under parts — chin, throat and middle of belly — pure white, the breast usually white also, but sometimes faintly clouded with Isabella color; rump, upper tail-coverts and scapulars dusky brown — Prout's brown to mummy brown.

Cistothorus (Telmatodytes) palustris dissaëptus, subsp. nov.

Type, from Wayland, Mass., No. 9796 coll. of E. A. and O. Bangs, adult ♂ taken May 31, 1879 by E. A. and O. Bangs.

Distribution: In the breeding season fresh-water marshes of eastern United States and parts of Canada, certainly from the Middle States north to Massachusetts, Ontario and southern Manitoba. Winters from Massachusetts southward, perhaps to eastern Mexico.

Characters: Size large: in ♂, wing 50.5 to 52; tail, 40 to 42; tarsus, 19.5 to 20.5; exposed culmen, 15 to 15.5; in ♀ wing, 48 to 49; tail, 40 to 40.5; tarsus, 18 to 19.5; exposed culmen, 14 to 15; bill stout in proportion. Pale areas of under parts — chin, throat and middle of belly — buffy white to pale wood brown, the breast usually much clouded with wood brown; rump, upper tail-coverts and scapulars reddish brown — russet to burnt umber.

According to my views of the relationships of the Long-billed Marsh Wrens, the various forms of the subgenus *Telmatodytes* should be arranged as follows.

Cistothorus palustris palustris (Wils.). Salt marshes of Atlantic coast from Connecticut to Virginia, in winter to South Carolina.

Cistothorus palustris dissaëptus Bangs. Fresh-water marshes of eastern United States and parts of Canada, breeding from Middle States to Massachusetts, Ontario and southern Manitoba, wintering from Massachusetts southward, probably to eastern Mexico.

Cistothorus palustris paludicola Baird. Pacific coast region of United States and southern British Columbia. Probably nearly non-migratory.

Cistothorus palustris plesius Oberholser. Western United States and interior British Columbia from the Sierra Nevada and Cascade Mts. to the Rocky Mts., south to southern Mexico. Probably only migratory at

northern parts of its range. Probably also breeds in southern Mexico, as I have an adult ♀ taken at Jalapa April 15, 1897, by Mr. C. B. Isham.[1]

Cistothorus marianæ Scott. Salt marshes of western Florida, non-migratory.

Cistothorus griseus Brewster. Salt marshes of Atlantic coast, from South Carolina to Matanzas Inlet, Fla., non-migratory.

SICKLE-BILLED CURLEW.

BY C. W. WICKERSHAM.

THE NAME Curlew, or Curlieu, is applied to this genus as an imitation of its long, short-ending call note and originates with the French, whence the second name mentioned above. Species of Curlew are met with all over the known world, but none, except, perhaps, the Australian Curlew, can vie with our Sickle-bill either in size, shyness or cunning.

The Sickle-billed Curlew (*Numenius longirostris*) is found in almost every part of North America but it is only in the west and extreme south that it is met with in considerable numbers; the southwest in winter and the northwest in summer. On our Atlantic seaboard it is famous for its littoral habits, nesting in the Carolinas, Georgia and Florida, on the beaches and keys, spending his days probing the sand, wet from the retreating tide, for his food and generally supplementing the proof furnished by his long curved bill that he belongs, body and soul, to the shore birds.

But in the interior he leads quite a different life; for here we

[1] The occurrence of this species at Jalapa is recorded by Mr. F. M. Chapman (Bull. Amer. Mus. Nat. Hist., X, 1898, p. 23) as follows: "On the outskirts of Jalapa there is a small marsh grown with high grasses and reeds, in which there were about a dozen individuals of this bird, which has apparently not before been recorded from Mexico. The three specimens secured are evidently to be referred to the interior form of Long-billed Marsh Wren recently distinguished by Mr. H. C. Oberholser under the above name [*Cistothorus palustris plesius*]. They were females, and on dissection the ovaries showed no signs of enlargement."

find him living on open prairie land, often far from water, nesting on the uplands, stalking along over the dry prairie, sometimes bobbing up and down like a sandpiper, at others sinking his long bill, with its tender ends into the ground, first on this side and then on the other, as he draws worm after worm out of its home to sustain life in his graceful body. As evening falls he becomes restless, his hunting comes to an end, his bobbing becomes more jerky and more and more repeated, until with a loud whistle he jumps forward, his long wings fly out and up and with the first unsteadiness over he joins the bunch in a long line and betakes his way with the others towards some distant marsh or pond. On, on they go; the leader whistles, the others answer, suddenly they all drop, sweep forward and up a little and then, with wings almost meeting above them and legs held daintily down to break the shock, they all alight. For five minutes there is no movement, no sound; there are no birds to be seen where, a moment before, the graceful creatures had alighted; suddenly there is a little flutter of wings and before you know it numerous forms have run forward and bent over the water to noisily quench their thirst. For another five minutes there is as great a confusion and clamor as formerly there was order and quiet; wings are fluttering, hoarse, short cries are arising, feet are pattering up and down, the water is heavily rippling from the motion of many bills and, in a word, all is chaos. One by one the drinkers cease, calmness is gradually restored, and, after pluming themselves, the birds draw one leg up under them, tuck their head under one wing, neatly fold the other, and sweet slumber reigns.

In the interior they begin to go north in May or the latter part of April and household cares take up the month of June from Arizona and Kansas north to Manitoba. July is spent in raising the chicks and by the middle or latter part of August, all is ready for the flight south to Texas, Mexico, Florida and the West Indies. Then it is that we see them in great flocks of hundreds, bobbing up and down all over the prairie, more nervous than ever; and then it is that they are least wary at times and at other times so very wary that it is impossible to approach them. They are so nervous and upset that they do not seem to know their own mind and it is at that season of the year that their antics become almost

as ridiculous as they are just before the breeding season. The day comes when you stroll out to take notes on the birds that you have seen by the hundreds the day before only to find that they have disappeared; not a bird answers your call, no hoarse screaming betokens your approach; they have gone, gone far away in long V-like squadrons and, unless you follow them to their winter home in the south land, you will not see their familiar forms for many months.

After reaching its winter home, the Curlew undergoes little change of habits except in his relation to other birds. For a few days the big bunches stay together and then they begin to separate into small bunches of from two to twenty birds. It is rarely that a single one is seen entirely by himself but two or three feeding together and then, perhaps a mile off, two or three more and in this way scattered all over the pastures and prairies is the way we find them in Texas. They are rarely found in the brush or even in ponds or swales surrounded by the brush, but far out on the open prairie or in little mud flats on the larger swales we rarely miss them. Here they feed all day looking for almost any form of insectivorous or crustacean life. Crawfish, small crabs, snails, periwinkles, toads, worms, larvæ, grasshoppers, crickets, beetles, caterpillars when found on the ground, spiders, flies, butterflies and berries, especially dewberries, all play minor or major parts in their diet. The worms, larvæ, etc., are pulled out of the ground by the long bill, the end of which may act as a finger having separate muscles to control it, and often it is sunk into the ground as far as it will go to reach some unwilling victim. The crustaceans are taken on the beach, or, discovered beneath the surface by the probing bill, are pulled out and eaten. The berries are neatly picked off the bushes, while butterflies and other insects are taken on the wing. At night the birds collect and make for the nearest large body of water where they spend the hours of darkness; but the return is made before light except on dark cloudy mornings when they have to wait for dawn to show them the way. On the wing they are easily distinguished by their snipe-like flight, their long, curved bill and their peculiar motion of beating wings which is so impossible to describe to those who have not seen it.

Wherever the Curlew goes, its long, curious bill makes it so

conspicuous that it is hunted much, but the embryo hunters have found, much to their chagrin, that it is next door to impossible to stalk the wary bird. Despite this, the Curlew decoys readily and is often 'whistled down' by an imitation of his call. Wound one and his yelping will attract every other Sickle-bill within hearing distance, and they will circle and return time and again until the last one is killed.

The nest is a mere depression in the ground, sometimes with a small lining of dead grass, in which are placed three or four ashy clay-colored eggs, covered with a few brown or chocolate spots and blotches. In the Northwest the nest may often be found under or at the foot of a sage bush but more often it is right out on the open prairie where both birds, male and female, help in the task of incubation and upbringing.

BIRDS OF PORTO RICO.

BY B. S. BOWDISH.

WHEN, in 1898, I began to study the birds of Porto Rico, I was somewhat surprised to find how meagre was the literature on the subject. Later, as my work slowly progressed, I felt a growing desire to add at least a little to the general fund of knowledge respecting Porto Rican ornithology, and to this end I have decided to submit the following notes, based on my own observations, extending from February 22, 1899, to February 16, 1900, and from May 5, 1900, to October 24, 1901. During most of this time — from February 22, 1899, to July 1, 1901 — I was in the army and my opportunities for ornithological work were limited by military duties. Later, while I was collecting specimens for the National Museum, my opportunities for observation were somewhat better, but even during this period of my stay in Porto Rico, observation was necessarily somewhat of a secondary matter.

Therefore it will be understood why the breeding habits of the birds, that most interesting and instructive feature of a bird's life, are here so scantily treated.

In this connection I take pleasure in acknowledging my indebtedness to Dr. Charles W. Richmond, of the U. S. National Museum, for furnishing me with a 'hypothetical list' of the birds likely to occur in Porto Rico, which was of much assistance to me in my field work, and also for his kindness in revising the manuscript of this list. I am also indebted to Mr. Frank M. Chapman, whose kind assistance in identifying some of the doubtful specimens in my collection has greatly aided me in the preparation of this paper.

In order to make the present paper a complete list of all the birds known to occur in Porto Rico I add at the end a supplemental list of species thus far recorded from the island that were not observed by me. This list is based mainly on Dr. Richmond's above-mentioned 'hypothetical list.'

1. **Podilymbus podiceps.** PIED-BILLED GREBE.— I purchased a female from a native at Aguadilla, June 3, 1900. It is slightly smaller than northern birds. The ovaries were somewhat developed. Stomach contained the remains of three crawfish and a small quantity of mammal hair; apparently the bird had fed on a drowned and partially decomposed rat. Perhaps not uncommon in suitable localities.

2. **Larus atricilla.** LAUGHING GULL.—Abundant around the coasts and on the outlying islands. At San Juan the natives often had them alive, with a wing clipped, and sold them for food. A friend purchased and gave me a female which I kept alive from April 28 to May 3, 1900, when I was obliged to dispose of it. It was not very wild, although objecting to being handled, and ate and drank freely. I fed it both raw and cooked beef. When I visited Decicheo Island on June 24, 1900, and again July 6 to 10, 1901, I found about eight or ten pairs, but got no data as to their breeding. At the time of the latter trip I noticed a pair feeding on the floating body of a Booby I had skinned and thrown into the water.

3. **Sterna antillarum.** LEAST TERN.— Noted one pair near Cabo Rono lighthouse, Aug. 22, 1901.

4. **Sterna fuliginosa.** SOOTY TERN.— Common at Mona Island on the occasion of my visit there, Aug. 5 to 21, 1901. An immature female which flew against the light during a cloudy night, Aug. 13, was injured and captured. At times large numbers of birds are said to fly against the light.

5. **Sterna anæthetus.** BRIDLED TERN.— Common on the islands of Mona and Decicheo, where they breed in large numbers; also frequently seen on the coast of the main island. On June 24, 1900, they were appar-

ently just beginning to breed, and the three single eggs found were nearly fresh. In each case they were laid in more concealed spots than those selected by the Noddy,— in one case under a rock on the beach, in another in a pocket in the face of a cliff near the top, and the third was in a hollow under a rock about fifteen feet above the beach. The birds were much shyer than the Noddy, leaving the nest with a dash before the intruder approached near enough to locate it. Another egg collected on July 6, 1901, and advanced in incubation, was laid on the bare earth, in a hollow behind a rock on a shelf in the face of a cliff ten feet above the beach. In no case was there the slightest nesting material. These breeding notes were made at Decicheo.

6. **Anous stolidus.** NODDY.— Not uncommon along the coasts of the main island, and by far the most abundant species on Mona and Decicheo. At the latter island, on June 24, 1900, a few had well grown young, and most of the eggs were advanced in incubation. These were laid almost invariably on the bare surface of the rock shelves in the face of the cliff, varying from eight to forty feet above the beach, and in only one or two cases was there a slight ring of bits of sticks and stones about them. They apparently do not lay more than one egg, and the various cliffs are occupied by one, two, three, or a larger number of birds, according to the accommodations; but the sitting birds were never found within reach of each other, which is probably due to their slightly quarrelsome disposition, all reports to the contrary notwithstanding. July 9, 1901, I placed a young one which had fallen from the nest on a rock near another. The parent of the latter attempted to drive the intruder away, when the intruding bird's parent took part in the disturbance, and thereafter there was a continuous dispute. At this date the Noddies had nearly all of them young of varying sizes. I found one egg nearly hatching and another almost fresh. In the stomach of one bird examined I found an entire flying-fish about four inches long and remains of others. Other stomachs contained fish remains. The method of feeding the young is by leisurely disgorging swallowed and half digested food well into the throat of the young. The common note resembles the clamor of young crows, and is often heard, more or less, throughout the night. Of a number of photographs taken I was able to save but one, of a young bird standing in the shadow of the rock and exhibiting in some degree an example of protective coloration.

7. **Phæthon,** sp. ? — I saw, but failed to secure, Tropic Birds at Decicheo and Mona Islands, but on one occasion, at Mona, a bird passed closely enough for me to distinctly see the yellow bill. Have also seen Tropic Birds at San Juan harbor.

8. **Sula sula.** BOOBY. — Abundant at Mona and Decicheo Islands, and often seen on the coasts of the main island. Probably breeds early as most of the young are on the wing by late June. I suspected the occurrence of other species of the genus at Decicheo, but failed to substantiate this suspicion. On July 9, 1900, at Aguadilla, I made the following note:

"They fly just over the waves, usually with steady beat of wing, but occasionally sailing for a distance with wing-tips curving down. At times they enter the water at a very slight angle while thus sailing. Again they rise some ten feet and descend perpendicularly, like an arrow, into the water. They dive readily and leave the water with the utmost ease, seeming to start as from a solid perch the instant they appear on the surface."

9. **Pelecanus occidentalis.** BROWN PELICAN. — Common everywhere about the coast of the main island, and on Vieques Island. Saw none, however, on Mona or Decicheo, nor did I locate any breeding place.

10. **Fregata aquila.** MAN-O'-WAR BIRD.— Common about the coast of the main island and on the islands of Vieques, Mona, and Decicheo, breeding on the two latter. On June 24, 1900, at Decicheo, a young male, nearly full grown but in immature plumage and unable to fly, was taken. My notes say: "Not well feathered; tail square, fork not developed; head and much of the plumage white; bill and feet bright blue."

11. **Phœnicopterus ruber.** AMERICAN FLAMINGO. — This bird is said to occur at times in the lagoons about Cabo Rojo.

12. **Ardea herodias.** GREAT BLUE HERON.— Common in suitable localities.

13. **Herodias egretta.** AMERICAN EGRET. — Common in suitable localities.

14. **Florida cærulea.** LITTLE BLUE HERON. — Common in suitable localities and particularly in the mangrove swamps about San Juan Bay where they doubtless breed.

15. **Butorides virescens.** GREEN HERON. — Common everywhere about the small streams, and quite fearless, allowing close approach. Several stomachs examined contained, respectively, remains of lizards and crabs, and one whole fish about six inches long; a kind of water beetle about three quarters of an inch long, many entire; crawfish and grasshoppers; eleven crawfish; small live worms.

16. **Nyctanassa violacea.** YELLOW-CROWNED NIGHT HERON.— Common in the localities visited. I even found it common on Mona, which seemed rather remarkable, as it is a dry, hot rock, with no sign of lagoon or swamp. Stomachs examined contained: fiddler crabs; two fresh water eels about six inches long, and two crawfish; also a number of live worms which may have been taken in with other food.

17. **Rallus longirostris caribæus.** CARIBBEAN CLAPPER RAIL. — Shot a male in a mangrove swamp near San Juan Bay, July 21, 1899. Stomach contained a few remains of fiddler crabs.

18. **Gallinula galeata.** FLORIDA GALLINULE. — Bought a female, with slightly developed ovaries, from a lad at Aguadilla, June 10, 1900. Stomach contained remains of small aquatic life. At Mayaguez, on June 12, 1901, a boy had two adults alive with the wings clipped.

19. **Tringa maculata.** PECTORAL SANDPIPER.— Sept. 26, 1900, during a 'wave' of Sandpipers, I took at a mud-flat in a cocoa grove, a female of this species, and I shot a male at the same place on Oct. 2. The stomachs in each case contained fiddler crabs.

20. **Tringa fuscicollis.** WHITE-RUMPED SANDPIPER.— This bird is not included in Dr. Richmond's list and was probably not recorded at the time of my going to Porto Rico. I shot a female at the above mentioned mud-flat, Oct. 2, 1900. Stomach contained fine grit, and well digested aquatic life.

21. **Tringa minutilla.** LEAST SANDPIPER.— On Sept. 23, 1900, at the mud-flat above referred to, I shot a male. At the same place, Sept. 4, 1901, I shot ten in a few minutes and could have shot many more. Their stomach contents was small snails and bits of grit. Dr. Richmond did not include the bird in his list and I am not sure that it has been previously recorded. I found the bird common also at Mona Island, where I shot a female Aug. 11, 1901.

22. **Totanus flavipes.** YELLOW-LEGS.— Shot a female at the above mentioned mud-flat, Oct. 7. Stomach contained a few grains of sand.

23. **Helodromas solitarius.** SOLITARY SANDPIPER.— Often seen in fall and winter. Shot a male Oct. 7, 1900, another on Oct. 18, a third Dec. 9, and a fourth on Sept. 5, 1901. Three stomachs were empty, the fourth contained a little fine aquatic life.

24. **Actitis macularia.** SPOTTED SANDPIPER.— Common through autumn and winter. Began to arrive by the middle of September, and was seen as late as April.

25. **Ægialitis vocifera.** KILLDEER.— Fairly common throughout the winter, at times feeding on the U. S. Infantry drill grounds. In 1899, at San Juan, I noted them as late as March 26. The following autumn I heard them first on Oct. 18. In 1900, I heard them on April 7. In the autumn I heard the first at Aguadilla, Oct. 7. In 1901 I recorded them on Feb. 28, at Aguadilla. I was away from Porto Rico during part of March and April, or I might have gotten a later date. In the autumn my date for their arrival at Mayaguez was Sept. 4.

26. **Ægialitis wilsonia rufinucha.**— Shot a male from a small flock of sandpipers on the beach at Vieques, Nov. 5, 1899. Stomach empty.

27. **Hæmatopus palliatus.** AMERICAN OYSTER-CATCHER.— A few noted at Decicheo.

28. **Colinus virginianus cubanensis?** CUBAN BOB-WHITE.— Introduced. Very rare. I saw one on a hill near Mayaguez, but it vanished before I could change the shell in my gun, and in the dense under-brush I was unable to again find it.

29. **Numida meleagris.** GUINEA FOWL.—Common in certain localities.

30. **Columba caribæa.** CARIBBEAN PIGEON.— According to Dr. Richmond: "Gosse says, 'in large flocks.' No other or later record."

31. **Columba squamosa.** SCALED PIGEON.— Common where not too much hunted. On Mona they were abundant, though not as much so as the next.

32. **Columba leucocephala.** WHITE-CROWNED PIGEON.— Sometimes seen about Mayaguez. Very abundant on Mona Island. One shot near Aguadilla Island. Probably common in all suitable localities.

33. **Zenaidura macroura.** MOURNING DOVE.— Common everywhere.

34. **Zenaida zenaida.** ZENAIDA DOVE.— Found abundantly on Mona Island, and probably common in other suitable localities. One shot near Aguadilla.

35. **Columbigallina passerina.** GROUND DOVE. — Common everywhere. The nests are built well above the ground, probably to avoid the depredations of the mongoose, and for a bird of this family are usually quite substantial. Nesting dates are: Near San Juan, July 19, 1899; eggs two, fresh; nest twelve inches above ground in a dead bush in bush-grown pasture. Measurements of nest: diameter 3.63 × 2.13 inches; depth 1.25 × .50. Aguadilla, June 9, 1900; eggs two, incubation advanced; nest eight feet from the ground, on a horizontal branch of a mango tree, in an open field. Measurements: diameter 4.75 × 2.13; depth 1.63 × .63. June 9, 1900, ten feet from ground. Incubation advanced. June 24, on top of stump among sprouts, nine feet from ground, and close to a house. Eggs fresh. July 12, two fresh eggs, eight feet from ground. July 22, two eggs, incubation advanced; twelve feet from ground, on extreme tip of a mango limb, near a house. July 27, two fresh eggs, twelve inches from ground in tiny thorn bush, in a cultivated field. Mona Island, Aug. 11, 1901, two eggs, about one half incubated. Nest three feet from ground in a bush near a path; also a single fresh egg on bare rock in path.

36. **Geotrygon chrysia.** QUAIL DOVE.— I only saw this species on Mona Island but it is doubtless found on the main island.

37. **Geotrygon montana.** RUDDY QUAIL-DOVE.— Noted at Vieques (where I shot a male Dec. 30, 1899), at Aguadilla, and very common on Mona Island.

38. **Buteo borealis.** RED-TAILED HAWK.— Nowhere rare, apparently quite abundant in the vicinity of Las Marias. I secured only two specimens, a male, Vieques, Jan. 26, 1900, the stomach containing the bones and hair of a rat, and a female at Mayaguez, July 31, 1901, the stomach containing the fur of a rat. This specimen was sent to the National Museum. Comparison of a series with specimens from the United States, may develop the fact that the birds from Porto Rico are entitled to subspecific recognition.

Near Cataño, March 27, 1899, I found a nest ready for occupation. It did not differ from nests of this species in the States, and was built in a large tree about 50 feet from the ground, on a wooded hillside.

39. **Falco dominicensis.** CUBAN SPARROW HAWK.— Common in all localities visited. Feeds chiefly on small lizards, grasshoppers and large insects.

40. **Pandion haliaetus carolinensis.** AMERICAN OSPREY.— Not abundant. I noted a pair at Vieques and secured the male, Dec. 31, 1899. Stomach empty. At Mona Island I saw the foot of one which had been shot there.

41. **Asio portoricensis.** PORTO RICAN OWL.— I saw a bird of this species in the marsh grass at San Juan Bay, Feb. 12, 1900. This was the only specimen noted.

42. **Gymnasio nudipes.** NAKED-FOOTED OWL.—Occurs abundantly about the coffee plantations near Mayaguez. The bird is said to bite the coffee berries as they are ripening (the natives declare the birds eat them, though I have never found traces of them in the stomachs examined), and at this time the bird's notes are likened by the natives to a song of *coffee, coffee, coffee*. It is said that considerable damage is done in this way.

At Mayaguez, May 16, 1901, I bought two young ones, about half-grown, from a native lad and caged them in quite roomy quarters, making photographs of them the next day. On the 21st I added an adult female and a young one not over a third the size of the others. At this time I was feeding them raw beef, serving each in turn, a piece being held out to them on the end of a wire. They ate very readily, the adult being the most conservative. My notes from this time run: May 22. Found adult had a broken leg and made an attempt at splintering it. When the older ones are hungry they swallow the meat as soon as it is handed out to them, but when not very hungry, they are inclined to seize it in one claw and attempt to tear it with their beaks. They are very bright. The little one ate a piece of meat this morning, but as yet I have not seen the adult eat anything. May 25. Owls still remain bright. Find they do not eat well during the day, so I place the meat in the cage at night only. I feed the youngest, who takes meat readily off the end of a wire but not from my fingers. He braces up and back as he sees the meat approaching, as though frightened; then, shutting his eyes, he seizes it in a desperate fashion. While I am about the cage he keeps up a sort of a low twittering, similar to the vesper peeping of young chickens when brooded by the hen; he also snaps his beak, and bites when handled. I have heard the others make no other sound than snapping the beak. Took some cockroaches to the owls this evening. Since the last two were put in the cage I have not seen the first two come down from the higher perches, but this evening all four were on the floor where they had been feeding on beef, and were bright and fierce. May 27. Bought two more young owls, a little smaller than the first pair. May 28. To-day I heard from the old one and from one of the young ones a slight cry like that of the low guttural growl of a cat. May 29. To-day while working near the cage I heard a sort of squeaking cry from one of the owls. This evening when I went to feed them, I found one of the last pair dead. The stomach, though empty, had evidently not long been so, and though the condition of the bird was poor, it was perhaps no more so than normally. June 1. The remaining five owls seem to be doing well, and the youngest grows remarkably fast. June 4. This P. M. I found my adult owl dead. The leg had pretty well healed, but the bone would hardly have knit properly. Stomach contained almost perfectly digested meat, and grit from the floor of the cage. The remaining four appear bright. Am teaching the youngest to feed himself. He was on the perch for the first time to-night. June 6. Took three more photo-

graphs of the youngest owl. He has developed wonderfully since last photographed. He drooped his wings and bristled like the others. June 12. Another of the owls died to-day. They do not seem to do well on the meat of birds, and this is all I have had for them lately. June 13. Gave my owls a feed of disabled cockroaches, which they seemed to relish very much. Though they are active in daylight, when subjected to lantern-light at night, they seem blinded and stupid. June 21. Found one of my young owls dead this evening.

The remaining owl died while I was at Mona, in August. The one dying on June 21, had lived from May 16 until that time in confinement; the last one lived from May 27 until the middle of August. They occupied a roomy cage on the roof, and had I been able to provide them with a more insectivorous diet, I presume they would have lived longer. In the case of the youngest, it was my purpose to photograph him each week until full grown, but the loss of a box of negatives in the mail, and the premature demise of my subject frustrated my plan.

I vainly tried to get information as to the nesting of these owls from the natives, and they assured me that seeing an owl, or as they called it a 'mookera,' in the day time was an impossibility, yet I did repeatedly, see them roosting in some sheltered spot, both in the coffee bushes and in the trees above them. A female sitting in a tree over a grosbeak that I shot, did not move until I saw and shot it; at this shot the male flew to a near-by tree, where I also secured him. Their stomachs contained the remains of beetles, many quite small, and a few cockroaches. This was June 27, 1901. From the results of my study of them, I should be very strongly inclined to think the coffee eating stories altogether unfounded, and without doubt based on circumstantial evidence, as is so often the case with the evil reports of birds. They doubtless eat harmful coleoptera, and as they seem to have no taste for bird-flesh, I should say that they are a very desirable species and deserve protection.

43. **Amazona vittata.** PARROT. — Still fairly common in the wilder mountain regions, but I was not fortunate enough to secure any.

44. **Crotophaga ani.** ANI. — Exceedingly abundant everywhere. I searched vainly for a nest till finally, at Aguadilla, a boy brought five eggs to sell me that I was at once sure belonged to this species. I secured them and a promise of more. On August 13 he brought me twenty more, all taken from one nest. I immediately persuaded him to take me to the nest, and found it to be in a small tree about eight feet from the ground, in a jungle of bushes and trees, just at the foot of one of the small bush-grown conical hills that, near Aguadilla, rise from the level, cleared pasture lands. The birds were still about the nest and noisy, and there was no further doubt as to the identity of the eggs.

The nest, built of fine twigs and dead leaves, was large, bulky, and originally deeply cupped. Probably four or five females contributed to this set, that being the usual custom. When a layer of four or five eggs is laid a layer of dead leaves is deposited over them and a second layer of

eggs laid, and by the time the set is completed the nest is pretty well filled. The measurements of the nest were: depth 6.00 × 1.50; diameter, 9.00 × 4.50 inches. Of the eggs, incubation had begun in eight. The other twelve were fresh. They are cuckoo's egg blue, streaked longitudinally with a limy white deposit which washing does not remove. They average 1.55 × 1.08 inches, and five individuals selected at random measure: 1.50 × 1.00; 1.57 × 1.10; 1.59 × 1.10; 1.53 × 1.09; 1.56 × 1.10. A pair of birds that I shot from a flock feeding in a pasture had their stomachs distended with grasshoppers, probably fifty or more in each.

Of other stomachs examined the largest proportion of the contents was insects, a small percentage being seeds. These strange birds, with their quaint cry, are called 'black witch' by the English speaking people of the West Indies, and 'hudia' in Spanish.

45. **Saurothera vieilloti.** VIEILLOT'S GROUND CUCKOO.— Not rare, but not nearly as common as is *S. merlini* in Cuba, and much more retiring. Its notes are cuckoo-like but deeper and more guttural than those of our birds. Though the birds are called 'lizard cuckoo,' I found a lizard in but one of the stomachs examined, insect food, largely coleoptera, prevailing. Of their breeding I unfortunately learned nothing.

46. **Coccyzus minor dominicensis.** MANGROVE CUCKOO. — This bird, like the last, is apparently not abundant in Porto Rico, though I found them fairly so at Mona Island. The notes are much like those of the Yellow-billed Cuckoo. A female shot near Mayaguez, Sept., 1901, would have laid the first egg the next day. This is the meagre information of their breeding which I gathered. Lizards as well as insects enter into their diet. The stomach of the specimen taken contained two lizards, a snail, and a katydid.

47. **Coccyzus americanus.** YELLOW-BILLED CUCKOO. — I shot several near Aguadilla, and secured one on Mona Island. They do not appear to be abundant.

48. **Todus hypochondriacus.** Very plentiful about Aguadilla and Mayaguez, especially the latter. They were not abundant in the vicinity of San Juan, and I did not find them on the smaller islands. Structurally its closest affinity is with the Kingfisher.

This bird belongs to a genus comprising six species, all occurring in the Greater Antilles. They are quite fearless of man, and often approach within two or three feet of the observer, apparently moved by curiosity. The condition of birds examined on Feb. 3 indicated the approach of the breeding season, and others examined on May 30 that the breeding season was well along.

I was unable to find a nest but a lad who claimed to have found them said they laid in burrows dug in a bank of earth, and that the eggs were white. One of the notes of this species is curiously like the low *quack* of a duck, but loud for the size of the bird. It also at times emits a sound like a whir of springs, usually when taking a short flight. In mentioning this characteristic of the Cuban bird, *T. multicolor*, Mr. Chapman says he

is inclined to attribute the sound to the attenuate outer primary, stating that the sound is not mentioned in descriptions of the Jamaican bird, *T. viridis*, and that he finds the outer primary shorter and not so attenuate, curved and stiffened as in the Cuban species.[1] I have not had the opportunity of examining the Jamaican birds, but comparison of the few specimens of *T. hypochondriacus* with *T. multicolor* in my collection shows the outer primary of the former to be decidedly shorter and less attenuate than that of the latter. These birds sit on a twig watching for their prey often with the beak pointed almost straight up, and darting suddenly from this perch they sometimes take an insect on the wing, though more often hover in front of a leaf or flower for that purpose, somewhat after the manner of a hummingbird, but for a shorter period and with less rapid wing-beats. Its food is entirely minute insects. I kept a wounded bird in a cage for two days, during which time he ate voraciously of finely chopped hard-boiled egg, and drank freely from the water dish. He did not seem to be at all put out by my presence, and ate and drank while I was putting food in the cage.

49. **Ceryle alcyon.** BELTED KINGFISHER.— Though less abundant than in Cuba, this bird is common throughout the winter. I noted it at Aguadilla, Oct. 7, 1900, but have no record for their northward departure. The food while here seems to be largely crawfish.

50. **Melanerpes portoricensis.** PORTO RICO WOODPECKER.—Abundant wherever there is enough timber to attract it. I found it on Vieques but not on Mona Island, nor on Decicheo. In general habits, notes, etc., it strongly reminds one of *M. erythrocephalus*, and is equally noisy and vociferous. It is a fruit-eater, even more so than its cousin, and the larger proportion of its food is of a vegetable nature. I have never seen it take food on the wing as does our Red-head. Near San Juan, on July 2, 1899, I made the following note:

"*Melanerpes portoricensis* has many harsh notes somewhat similar to notes of the Flicker, and like that bird it is quite garrulous." April 8, 1900, near Cataño, I shot a female from a pair on a dead snag, and afterwards discovered a freshly excavated cavity close to where they had been sitting. Examination proved it to be not yet completed. It was in every respect like a nesting cavity of the Red-head, and was about twelve feet from the ground. Examination of the bird showed she would not have laid for at least a week. Another pair taken near the same locality April 22, were evidently nearly ready for nesting.

51. **Antrostomus carolinensis.** CHUCK-WILLS-WIDOW.— I found this bird only on the island of Vieques, where in a certain creek bottom I shot two and noted a number more, Dec. 15 and 28, 1899. I secured females in both cases, the stomachs of which were well filled with insects.

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[1] 'Notes on Birds and Mammals Observed near Trinidad, Cuba, with remarks on the Origin of West Indian Bird-life.' By F. M. Chapman. Bull. Amer. Mus. Nat. Hist., Vol. V, pp. 279–330.

52. **Cypseloides niger.** BLACK SWIFT.—Noted a few but failed to secure any.

53. **Lampornis virginalis.**— Common at all points which I visited. At Aguadilla, July 21, 1900, I found a nest, to which I was attracted by the angry demonstrations of the female bird. I first noticed her chase a *Myiarchus antillarum* out of the tree. It was a large tree standing in a corn field, but I failed to locate the nest by watching the bird. She several times took a flight of about ten rods, returning immediately, but would not go to the nest. It was finally found by close search. It was on the end of a limb about ten feet from the ground, and contained two young about half grown. It was well sheltered by large leaves growing above, was cottony in appearance and not particularly handsome, resembling some of the poorer nests of *Trochilus colubris.* March 1, 1901, I made the following note: "Heard a *Lampornis virginalis* sing a 'song,' a sort of prolonged trill or twitter. It also utters sharp chips. When hovering in front of a flower the motion of the wings seems sometimes quite slow, almost within the power of vision, and it sometimes alights on a twig to feed from a flower." Their habits are in general much the same as those of other hummingbirds.

54. **Sporadinus maugæi.** Fairly common though not abundant about Mayaguez and Las Marias. Not seen near San Juan nor on Vieques Island.

(*To be concluded.*)

THE RELATION OF THE FOOD TO THE SIZE AND SHAPE OF THE BILL IN THE GALAPAGOS GENUS *GEOSPIZA.*

BY ROBERT E. SNODGRASS.

THE Fringillid genus *Geospiza*[1] of the Galapagos Archipelago contains about thirty-four species and varieties. Four subgenera may be distinguished on a color basis, but the specific and varietal character are almost entirely in the shape and size of the bill. The bill being the feeding organ, it is most natural to look first for the cause of its variation in a variation of the character of the food.

Geospiza heliobates feeds entirely on insects. But it inhabits exclusively the 'mangrove swamps' where there is nothing but insect food available. The other species are all seed-eaters, although they occasionally pick up a few ants and other small insects. The seeds that they eat are mostly small and they are usually swallowed whole, being found in this condition in the crop. Large seeds when eaten are broken into pieces by the beak before being swallowed, generally only fragments of such are to be found in the stomach. The birds feed a great deal upon the ground, picking up seeds that have fallen from the bushes, and at the same time taking in with the food a considerable amount of gravel.

With a view of determining whether there is any corresponding variation between the bills and the food, Mr. Edmund Heller and the writer, during 1898 and 1899, preserved the stomachs of two hundred and nine specimens of *Geospiza*. These represent *G. pachyrhyncha, G. strenua, G. conirostris, G. fortis fortis, G. fortis platyrhyncha, G. fuliginosa, G. scandens, G. scandens fatigata, G.*

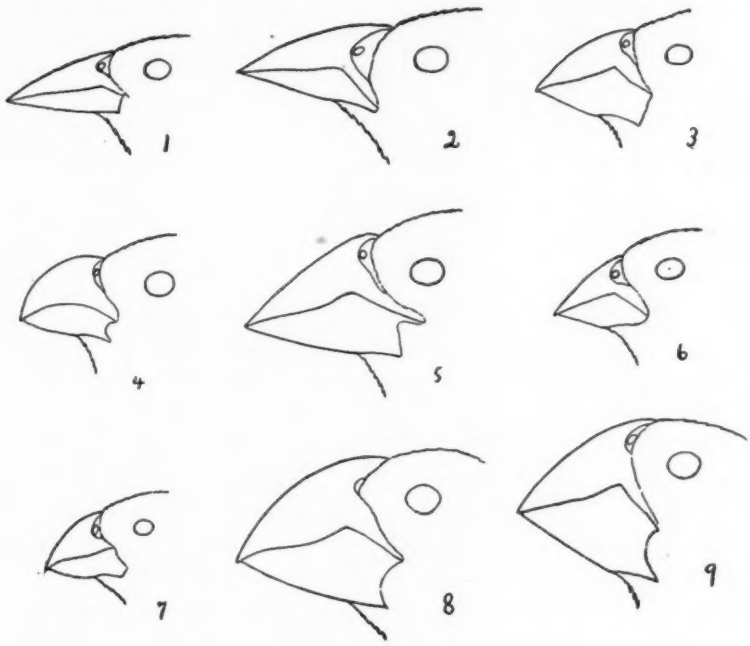
[1] The name *Geospiza* is here used in the same sense as used by Rothschild and Hartert (Novit. Zool., VI, 1899), *i. e.*, to include all of the related Galapagos genera of other authors, such as *Platyspiza, Camarhynchus, Geospiza* and *Cactornis*. Such a group is certainly a natural one; and in it lines of division are difficult to draw. Ridgway recognizes three genera: *Platyspiza, Camarhynchus* and *Geospiza*. The names of species are according to the synonymy in a paper yet to be published by Mr. Edmund Heller and the writer.

scandens rothschildi, *G. affinis*, *G. crassirostris*, *G. prosthemelas*, *G. heliobates*. The specimens were collected from the islands of Albemarle, Narborough, James, Seymour, Duncan, Charles, Hood, Barrington, Tower and Bindloe. The dates run from December till June, inclusive.

Comparison has been made of the food of individuals of the same species at different places, and of the food of different species at the same and at different places. The results are somewhat conflicting. In any case one would require a great amount of evidence to come to any definite conclusions. Then, too, there is always a doubt created by the fact that the specimens were not taken on the different islands during the same months, and by the fact that the seasons vary considerably at different localities. What might appear to be evidence of a difference in food habit between a species on one island and a different one on another island, might be nothing more than a seasonal change of diet due to different plants being in seed at the two times. However, a few conclusions may be positively deduced, the results being sufficient to warrant the discussion.

The detailed records of the two hundred and nine stomachs are omitted. The data obtained are given in the following table, and the seeds are illustrated on Plates XII and XIII. The seeds have not been identified, but the names are not necessary. They are drawn to show their relative sizes, and are referred to in the succeeding discussion by their numbers on the plates. Figures 1 to 44, inclusive, except figure 42, are magnified $6\frac{2}{3}$ times. The others are magnified only half as much. The stomachs of Mockingbirds (*Nesomimus*) from eight islands have been examined in the same way. The records of these are given at the end of the table, and the seeds are figured on the plates along with the *Geospiza* seeds. The stomachs of all contained a total of sixty kinds of seeds. Seeds Nos. 59 and 60 are not figured.

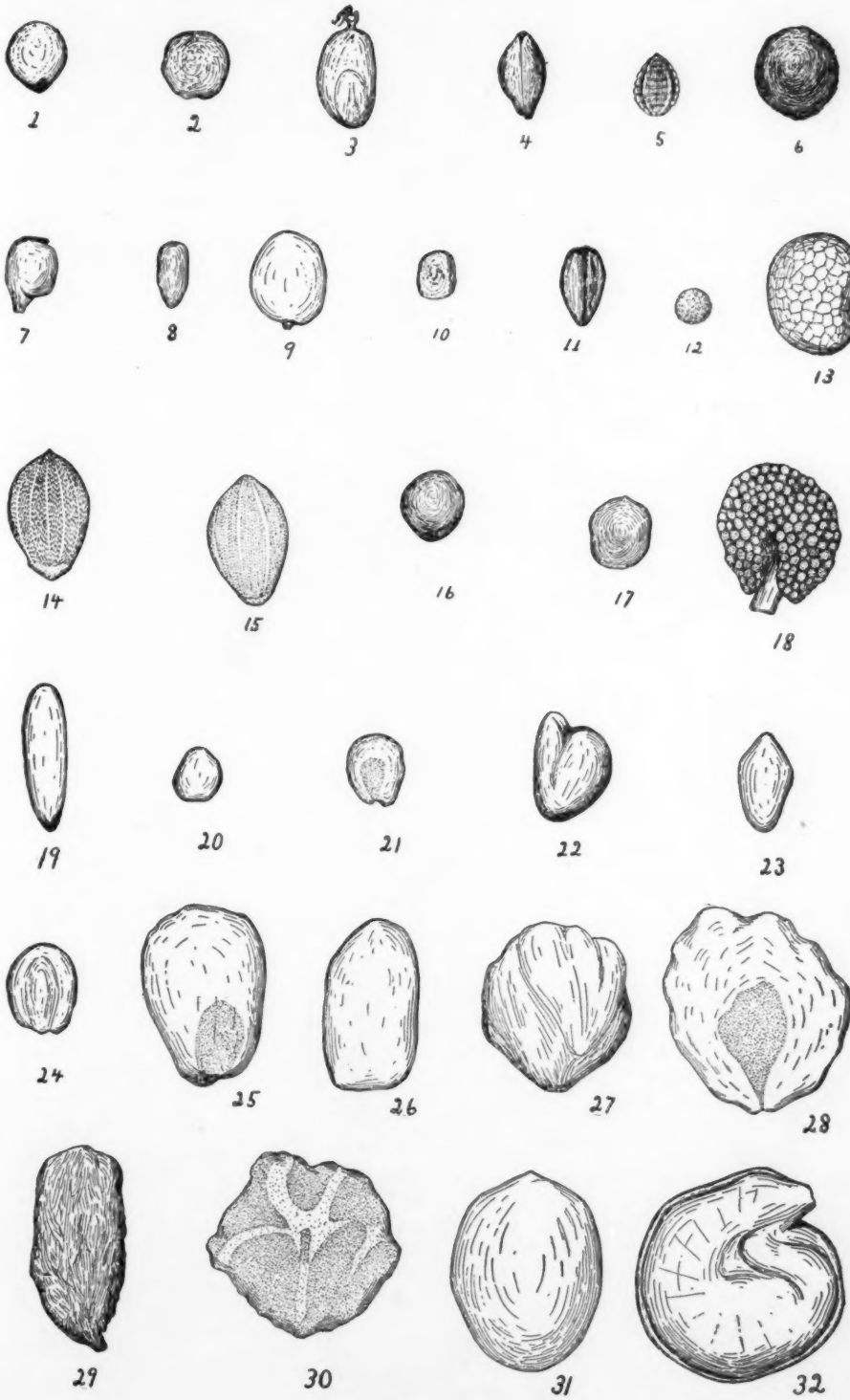
Following is the table (pp. 369–374) containing the records of the examination. It of course does not show the relative numbers of each seed present.



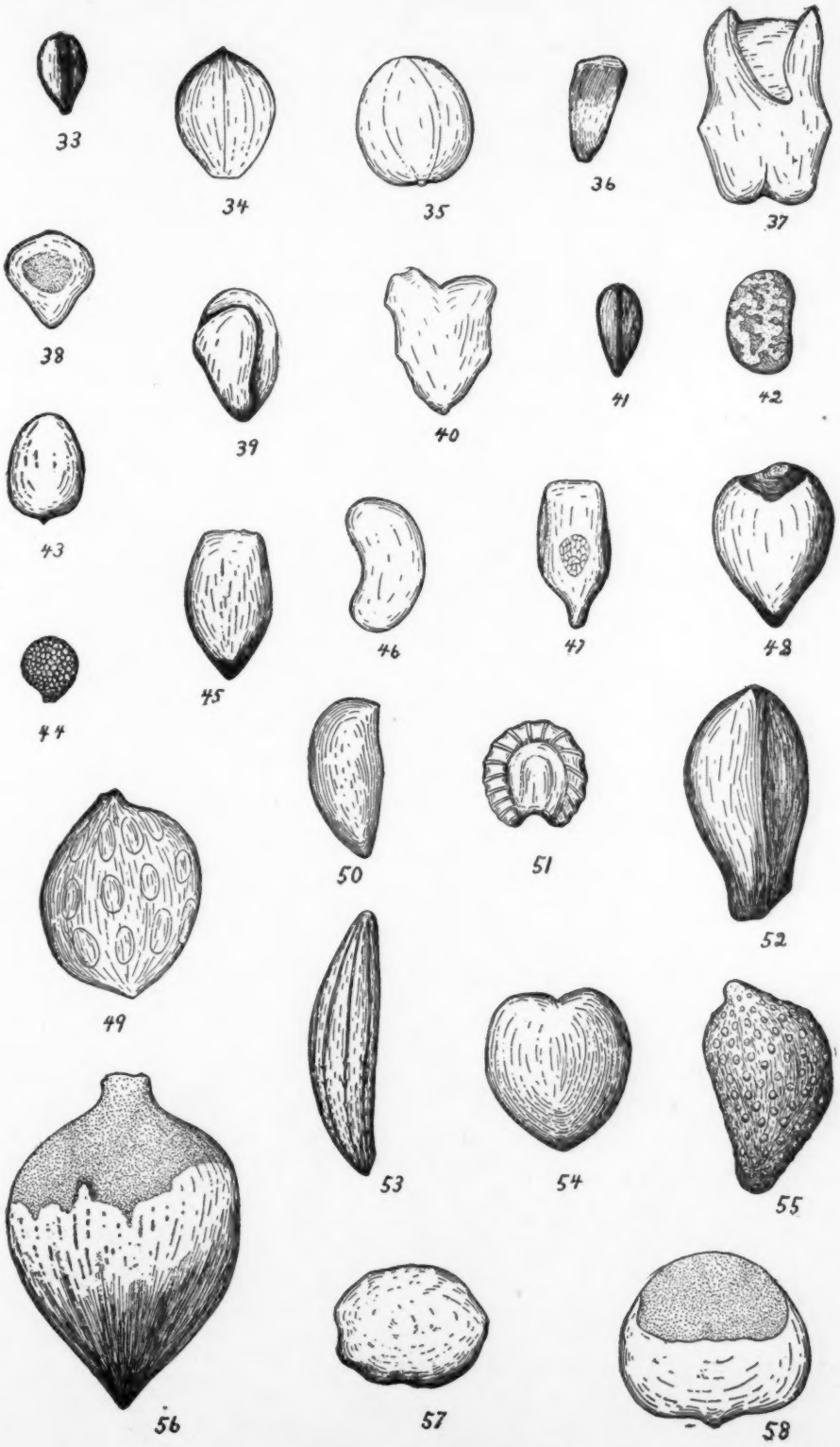
BILLS OF GEOSPIZA.

Natural Size.

Fig. 1. *Geospiza scandens scandens*, James Island, from Ridgway.
Fig. 2. *G. scandens rothschildi*, Bindloe Island.
Fig. 3. *G. fortis fortis*, Albemarle Island, from Ridgway.
Fig. 4. *G. crassirostris*, from Ridgway after Gould.
Fig. 5. *G. conirostris conirostris*, Hood Island, from Ridgway.
Fig. 6. *G. fuliginosa parvula*, Tagus Cove, Albemarle Island.
Fig. 7. *G. prosthemelas prosthemelas*, Albemarle Island.
Fig. 8. *G. strenua*, Albemarle Island, from Rothschild.
Fig. 9. *G. pachyrhyncha*, Tower Island, from Ridgway.



FOOD SEEDS OF GALAPAGOS BIRDS.



FOOD SEEDS OF GALAPAGOS BIRDS.

TABLE OF FOOD SEEDS.

The numbers at the head of the columns refer to the seeds as figured and numbered in Plates XII and XIII.

SPECIES OF BIRDS.	5	8	10	11	13	14	15	17	18	22	23	26	28	29	44	46	57	59	LOCALITY.	DATE.
Geospiza pachyrhyncha (Pl. XI, Fig. 9).																	×		Tower	June
" "																	×		"	"
" "																	×		"	"
" "																	×		"	"
" "																	×		"	"
" "																	×		"	"
" "																	×		"	"
G. strenua (Pl. XI, Fig. 8).										×									Narborough	Jan.
" "				×								×	×						James	April
" "									×			×							"	"
" "									×			×							"	"
" "																	×	×	"	"
" "						×	×		×									×	"	"
" "																×			Bindloe	June
G. conirostris conirostris (Pl. XI, Fig. 5).						×	×	×							×				Hood	May
" "						×	×	×				×							"	"
" "			×			×	×	×											"	"
" "			×			×	×	×				×	×						"	"
" "			×			×	×	×			×	×		×					"	"
" "						×	×	×											"	"
" "			×				×					×							"	"
" "				×		×													"	"
" "					×	×	×					×	×						"	"
" "			×			×	×										×		"	"
" "	×					×	×												"	"
" "			×			×	×												"	"
" "							×						×						"	"

TABLE OF FOOD SEEDS (CONTINUED).

SPECIES OF BIRDS.	2	3	4	5	8	9	15	21	22	23	24	28	33	35	38	40	41	48	57	59	LOCALITY.	DATE.
G. fortis fortis (Pl. XI, Fig. 3).					×							×									Tagus Cove	Jan.
" "									×	×											"	"
" "												×?									"	"
" "			×						×												"	"
" "		×				×															"	"
" "		×							×												"	"
" "		×																			"	"
" "		×																			"	"
" "	×													×							Narborough	"
" "									×				×	×	×						"	"
" "														×							"	"
" "							×	×									×				James	April
" "							×										×				"	"
" "								×											×	×	"	"
G. fortis platyrhyncha														×				×			Iguana Cove	"
G. fuliginosa parvula															×						"	"
(Pl. XI, Fig. 6).															×			×			Tagus Cove	Jan.
" "					×											×					"	"
" "					×																"	"
" "					×				×												"	"
" "					×				×												"	"
" "					×				×												"	"
" "					×				×								×				"	"
" "					×																"	"
" "			×								×										"	"
" "					×						×										"	"
" "			×		×																"	"
" "					×																"	"

TABLE OF FOOD SEEDS (CONTINUED).

SPECIES OF BIRDS.	1	2	4	6	8	10	11	14	15	17	18	19	21	22	26	41	44	45	55	57	59	LOCALITY.	DATE.
G. fuliginosa parvula (Pl. XI. Fig. 6).				×																		Tagus Cove	Jan.
" "				×																		"	"
" "																×						"	"
" "	×																					"	"
" "									×													"	"
" "	×																					"	"
" "			×																			Elizabeth Bay	Feb.
" "			×																			"	"
" "																	×					Iguana Cove	Dec.
" "									×													"	"
" "																			×			"	"
" "									×													"	"
" "									×													"	"
" "									×													"	"
" "									×													"	"
" "									×													"	"
" "	×		×																			"	"
" "									×													"	"
" "																	×					"	"
" "									×								×					"	"
" "		×							×													"	"
" "			×						×													"	"
" "			×						×													"	"
" "									×													"	"
" "					×																	Narborough	"
" "					×																	"	"
" "					×																	"	"
" "														×								"	"
" "														×								"	"
" "									×		×											James	April
" "																×					×	"	"
" "								×	×													Seymour	"
" "								×														"	"
" "								×	×													"	"
" "								×	×													"	"
" "								×	×													"	"
" "								×	×													"	"
" "								×	×												×	"	"
" "								×	×												×	"	"
" "								×													×	"	"

TABLE OF FOOD SEEDS (CONTINUED).

SPECIES OF BIRDS.	1	2	4	6	8	10	11	14	15	17	18	19	21	22	26	41	44	45	55	57	59	LOCALITY.	DATE.
G. fuliginosa parvula (Pl. XI, Fig. 6).	....	....	....	....	....	×	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	Seymour	April
" "	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	....	×	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	....	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	×	....	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	×	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	×	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	Duncan	May
" "	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	....	....	....	×	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	....	....	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	....	....	....	....	×	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	Barrington	"
" "	....	....	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	....	....	....	....	×	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
G. scandens scandens (Pl. XI, Fig. 1).	....	×	....	....	....	×	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	James	April
" "	....	....	....	....	....	....	....	....	×	....	....	....	....	....	....	×	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	....	×	....	....	....	....	....	....	×	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	....	....	×	....	×	....	×	×	....	....	....	....	×	"	"
" "	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	×	....	....	....	....	....	"	"
G. scandens fatigata	....	....	....	....	....	×	....	×	....	....	....	....	....	....	....	....	....	....	....	×	....	Seymour	"
" "	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	×	....	....	....	....	....	....	....	×	....	....	....	....	....	....	....	....	....	....	×	....	"	"
" "	....	....	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	×	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"
" "	....	....	....	....	....	....	....	×	×	....	....	....	....	....	....	....	....	....	....	....	....	"	"

TABLE OF FOOD SEEDS (CONTINUED).

SPECIES OF BIRDS.	2	4	10	11	12	14	15	16	20	25	31	36	39	40	41	44	46	55	57	60	LOCALITY.	DATE.
G. scandens fatigata.			×			×	×														Seymour	April
" "			×			×	×												×		"	"
" "			×			×	×												×		"	"
" "			×			×	×														"	"
" "						×	×														"	"
" "						×	×		×									×			"	"
" "						×															"	"
" "						×	×	×		×											"	"
" "						×	×	×													"	"
" "						×	×														"	"
" "						×	×												×		"	"
" "			×			×	×														"	"
" "						×	×														"	"
" "						×	×														"	"
" "			×			×	×														Barrington	May
" "						×	×				×						×				"	"
" "						×	×														"	"
" "			×			×															"	"
G. scandens rothschildi (Pl. XI, Fig. 2)				×											×						Bindloe	June
" "															×						"	"
" "							×														"	"
G. affinis							×									×					Iguana Cove	Dec.
"			×																		"	"
G. crassirostris (Pl. XI, Fig. 4).														×							"	"
" "														×							"	"
" "														×							"	"
" "														×							"	"
" "													×	×							"	"
																				×	Narborough	"
G. prosthemelas prosthemelas (Pl. XI, Fig. 7).					×										×						Albemarle	Jan.
" "												×			×						"	"
" "			×																		"	"
" "							×														"	"
" "	×	×																			"	"
" "	×																				"	"
" "							×								×						James	April
"							×														"	"

TABLE OF FOOD SEEDS (CONTINUED).

SPECIES OF BIRDS.	6	7	8	13	15	18	19	25	30	32	33	37	41	45	49	50	52	53	54	55	56	57	58	LOCALITY.	DATE.
Nesomimus melanotis parvulus																		×						Tagus Cove	Jan.
" "																		×	×					"	"
" "												×												"	"
" "						×						×												Elizabeth Bay	Feb.
" "																			×					"	"
" "																			×					"	"
" "																			×					"	"
" "																			×					"	"
" "																			×					"	"
" "											×								×					Narborough	Jan.
" "															×				×					"	"
" "																			×					"	"
" "																			×					"	"
" "															×				×					"	"
N. melanotis melanotis						×			×															James	April
N. melanotis dierythrus						×								×			×						×	Seymour	"
N. macdonaldi						×							×				×						×	"	"
" "	×					×																		Hood	May
" "						×																	×	"	"
" "						×																	×	"	"
" "						×																		"	"
N. barringtoni							×													×			×	Barrington	"
" "								×																"	"
" "										×														"	"
N. personatus bauri																					×			Tower	June
" "																					×			"	"
" "																					×			"	"
" "																					×			"	"
" "																					×			"	"
" "																						×		"	"
" "																					×			"	"
" "																					×			"	"
" "																					×			"	"
N. personatus bindloei			×						×								×						×	Bindloe	"
" "																	×						×	"	"
" "		×							×														×	"	"
" "				×					×															"	"
" "			×						×															"	"

From the facts given in the table the following propositions may be pretty well established.

I. *The food of* GEOSPIZA *as a whole differs from that of* NESOMIMUS.

This is evident from the fact that of the twenty-one seeds found in the *Nesomimus* stomachs, only eight were found in *Geospiza* stomachs. Of these seed No. 8, which was the predominant seed in the food of *Geospiza fuliginosa parvula* at Tagus Cove, Albemarle, was found in two specimens of *Nesomimus* from Bindloe Island. Seed No. 18, which occurred in eight *Nesomimus* stomachs, was present in only three *Geospiza* stomachs. The other seeds common to the diets of the two genera were of rare occurrence in each.

Nesomimus eats a great many more insects than does *Geospiza*, being insectivorous and granivorous in about equal proportions. Numerous pieces of large insects were found in nearly all of the *Nesomimus* stomachs, including grasshoppers, flies, beetles, caterpillars, and also spiders and centipedes. The seed part of the diet differs from the food of *Geospiza* in consisting of larger seeds, of seeds that the much smaller-mouthed *Geospizæ* could not handle.

II. *The same species at different localities may feed on different seeds.*

The truth of this statement is best shown by a study of the food of *Geospiza fuliginosa parvula* (Pl. XI, Fig. 6) the most widely spread and most abundant form of *Geospiza* on the archipelago. In the stomachs of nineteen specimens of this variety from Tagus Cove, Albemarle Island, collected in January, there was found a total of only eleven species of seeds. Of these, seed No. 1 had been eaten by two birds, No. 2 by one bird, No. 4 by two birds, No. 6 by two birds, No. 8 by nine birds, No. 15 by one bird, No. 22 by five birds, No. 24 by three birds, No. 41 by two birds, No. 58 by one bird, and No. 59 by one bird. This shows that the birds here feed on seed No. 8 more than any other, and that seed No. 22 was second in numbers. Moreover, these two seeds were present in much greater numbers than the others in each stomach in which they occurred.

From Elizabeth Bay, Albemarle, there are only two specimens

and each of these had only seed No. 4 in its stomach. The specimens were collected in February.

Seventeen specimens were examined from Iguana Cove at the southern end of Albemarle, separated from Tagus Cove by a distance of about fifty miles. Here seed No. 1 was eaten by one bird, No. 2 by one bird, No. 4 by one bird, No. 15 by thirteen birds, No. 44 by three birds, and No. 55 by one bird. Thus, the only seed fed on at all constantly by the Iguana Cove birds is seed No. 15 — a seed found in only one stomach at Tagus Cove. The Iguana Cove specimens were collected in December.

Since we do not know what species of plants the different seeds belong to, we cannot say whether the differences in the food of the birds at Tagus Cove and Iguana Cove is due to a difference in the floras of the two localities, to a difference in the time of ripening of the seeds, or to a difference in the preferences of the birds with regard to the seeds at the two places. Since, however, seed No. 15 was found in abundance in the stomachs of birds taken on James, Seymour, Duncan and Barrington Islands in April and May, it would appear that the seeds should be ripe at Tagus Cove in January if they are ripe at Iguana Cove in December. That the plant occurs at Tagus Cove is shown by the fact that the seeds were found here in one stomach. The entire diet of the Tagus Cove birds consisted of seeds Nos. 1, 2, 4, 6, 8, 15, 22, 24, 41, 58 and 59; that of the Iguana Cove birds of seeds Nos. 1, 2, 4, 15, 44 and 55. Of the thirteen kinds of seeds only four are common to both sets. Hence, there is most evidently a difference in the food of the individuals at the two places, at approximately the same time of the year. It is, perhaps, most probable that this difference is due to the same seeds not being available in the same relative numbers at the two places.

Of five specimens from Narborough Island, taken in December, three had in their stomachs only seed No. 8, the other two contained only seed No. 22. These thus fed on the principal part of the diet of the Tagus Cove birds.

On James, Seymour, Duncan and Barrington Islands *Geospiza fuliginosa parvula* feeds almost exclusively on seeds Nos. 14 and 15. Specimens of one or both of these seeds were found in the stomachs of all the thirty-six birds examined, except in one from

James and one from Barrington. Next to these, seeds Nos. 10 and 57 were most abundant, each being represented in ten stomachs. These four seeds were also by far the most abundant wherever they were found. The rest of the diet consisted of seed No. 2, found in two Seymour birds and in one Duncan bird; No. 11, found in one Seymour bird; No. 17, found in one Seymour bird; No. 18, found in one James bird; No. 20 found in one Duncan bird; and Nos. 41 and 59, found in one James bird. These specimens were all collected in April and May.

The facts just detailed certainly show that the individuals of *Geospiza fuliginosa parvula* living on Narborough and at Tagus Cove, Albemarle, during December and January, have a different diet from those individuals living at Iguana Cove, Albemarle, in December, and on James, Seymour, Duncan and Barrington in April and May. The proof, from these facts, of proposition I, however, is somewhat invalidated by the consideration that seeds Nos. 14 and 15 may ripen at Tagus Cove and on Narborough later than January. But seeds Nos. 8 and 22 were not found in any stomachs except in those of birds taken at Tagus Cove. We can see, at least, that the diet of the birds depends on the local prevalence of certain seeds; and that, where the floras differ, the food of a species may differ.

III. *Different species at the same locality may feed on the same kinds of seeds.*

This proposition is much easier to prove than the last. Compare, for example, the food of *Geospiza fuliginosa parvula* (Pl. XI, Fig. 6) and of *G. scandens fatigata* on Seymour and Barrington Islands. As has already been shown, the food of the former species consists almost wholly of seeds Nos. 10, 14, 15 and 57, Nos. 14 and 15 being in the majority. An examination of the table will show that the food of *G. scandens fatigata* on the two islands is practically identical with that of *G. fuliginosa parvula*, consisting mainly of seeds Nos. 14 and 15, with Nos. 10 and 57 second in numbers.

The case of these two species, then, proves that species differing much in the size and shape of the bill (Pl. XI, Figs. 1 and 6) may have absolutely the same food habits. We have not, however, the material at hand to justify the statement of this as a

general truth. We cannot show how far it actually holds true of other species on the archipelago. The similarity in the food of these two common forms on Seymour and Barrington Islands is so striking, however, that one is almost forced to the conclusion that all the species of *Geospiza* eat simply whatever seeds are accessible to them.

IV. *Different species at different localities may feed on the same kinds of seeds.*

The truth of this proposition may be seen by a comparison of the food of *Geospiza conirostris conirostris* (Pl. XI, Fig. 5) on Hood, *G. scandens fatigata* on Seymour and Barrington, and *G. fuliginosa parvula* at Iguana Cove, Albemarle, and on Seymour and Barrington. The largest part of the food of *G. conirostris conirostris* in May consisted of seeds Nos. 14 and 15. Next in numbers were seeds Nos. 10 and 17. All but two of thirteen birds had eaten No. 14, and all but one No. 15, while Nos. 10 and 17 were each represented in six stomachs. Seed No. 5 was found in one bird, No. 23 in one bird, No. 26 in five birds, No. 28 in three birds, No. 29 in one bird, and No. 57 in one bird.

Hence, the food of *G. conirostris* on Hood Island is in the main the same as that of *G. fuliginosa parvula* at Iguana cove, Albemarle, and on Seymour and Barrington Islands, and is also the same as that of *G. scandens fatigata* on Seymour and Barrington. There are thus three species of *Geospiza* with very different bills (Pl. XI, figs. 1, 5 and 6), living at three localities, whose food is almost identical at approximately the same time of the year.

V. *Different species at the same or at different localities may feed on different seeds.*

If the size and shape of the bill is dependent on the character of the food, this proposition should be a general truth. However, the material under consideration affords only a few instances of it.

Geospiza pachyrhyncha (Pl. XI, Fig. 9) is peculiar to Tower Island. The stomachs of seven specimens taken in June contained only seed No. 57. We have no data to show what the food of other species on Tower consists of. Vegetation is extremely scant on the island, and all the birds may be forced to eat the same seed.

A specimen of *Geospiza strenua* (Pl. XI, Fig. 8) taken in January on Narborough had only seed No. 22 in its stomach. Five speci-

mens taken in April on James island had fed as follows; in one stomach were seeds Nos. 11, 26 and 28; in two others seeds Nos. 18 and 26; in another seeds Nos. 57 and 59; in the fifth seeds Nos. 14, 15, 18 and 59. Of two taken in June on Bindloe one had in its stomach only seed No. 46, the other only seed No. 44. These very scant data would seem to indicate that *Geospiza strenua* uses but little selection in the choice of its food. Altogether it has been found to eat seeds Nos. 11, 14, 15, 18, 22, 26, 28, 44, 46, 57 and 59. The James specimens alone had eaten seeds Nos. 11, 14, 15, 18, 26, 28, 57 and 59. This list is somewhat different from the diet of six specimens of *G. scandens fatigata* taken at the same time on James. The stomachs of these birds gave the following: seed No. 2 in one bird, No. 14 in two birds, No. 15 in three birds, No. 18 in one bird, No. 21 in one bird, No. 26 in one bird, No. 41 in four birds, No. 59 in one bird. The species of seeds forming the list in the two cases are almost the same, the main difference is in the proportions of the seeds present. It is a question whether the evidence in this case should not be given to proposition III. It, however, shows the weakness of the proof on which proposition V could be stated as a general fact.

A good example of the proposition under consideration may be derived from a comparison of the food of *Geospiza fortis* (Pl. XI, Fig. 3) at Tagus Cove, Albemarle, with that of *G. fuliginosa parvula* at the same locality. As has already been shown, the food of nineteen Tagus Cove specimens of the latter species was as follows: seed No. 1 had been eaten by two birds, seed No. 2 by one bird, seed No. 4 by two birds, seed No. 6 by two birds, seed No. 8 by nine birds, seed No. 15 by one bird, seed No. 22 by five birds, seed No. 24 by three birds, seed No. 41 by two birds, seed No. 48 by one bird. The table shows the following composition of the food of thirteen Tagus Cove specimens of *Geospiza fortis* taken also during January. Seed No. 2 had been eaten by one bird, seed No. 3 by four birds, seed No. 4 by one bird, seed No. 8 by one bird, seed No. 9 by one bird, seed No. 22 by five birds, seed No. 28 by two birds, seed No. 33 by one bird, seed No. 35 by three birds. The only important difference in these two cases is the predominance of seed No. 8 in the food of *G. fuliginosa* and its scarcity in that of *G. fortis*. These two species have somewhat

similarly shaped bills (Plate XI, Figs. 6 and 3), but that of *G. fortis* is the heavier.

Two specimens of *G. fortis platyrhyncha* from Iguana Cove, Albemarle, taken in December, had eaten only seeds Nos. 38, 40 and 48, seeds not found in the stomachs of any of the Tagus Cove, *G. fortis*, nor in any of the Iguana Cove specimens of *G. fuliginosa*.

Four specimens of the *Geospiza fortis* on James Island, which does not differ from the *G. fortis* of Tagus Cove, had eaten as follows, in April. Seed No. 15 occurred in two stomachs, seed No. 21 in two, seed No. 41 in two, seed No. 57 in one, and seed No. 59 in one. It will be observed that there is no seed common to the three sets, *i. e.*, in the food of the James Island, Iguana Cove, and Tagus Cove specimens of *Geospiza fortis*. The case of the James Island and Tagus Cove specimens belongs to proposition II ; the *G. fortis platyrhyncha* differing from *G. fortis fortis* at two other localities belongs to proposition V. It is important to note that the food of all the individuals at any locality does not differ as a whole from that of the others, more than may the food of two individuals at the same locality.

Perhaps the best case under proposition V can be made out from a study of the food of *Geospiza crassirostris* (Pl. XI, Fig. 4) and of *G. fuliginosa parvula* at Iguana Cove, Albemarle. The food of five specimens of the former species, taken the last of December, consisted entirely of seeds Nos. 39 and 40, the former found in only one stomach, the latter in all. As has before been shown, *G. fuliginosa parvula* at Iguana Cove feeds almost entirely on seed No. 15, seeds Nos. 39 and 40 not being found in any of the stomachs.

VI. *Birds with small bills eat only small seeds; birds with large bills eat both small and large seeds.*

Geospiza fuliginosa (Pl. XI, Fig. 6) eats fern seeds larger than Nos. 14 and 15. The only larger one found in their stomachs is No. 57, but this is a thin, flat seed, and is nearly always broken into small pieces before being swallowed. In the stomachs of *G. strenua*, one of the large-billed species (Pl. XI, Fig. 8), there occurred, besides numerous small seeds, such larger ones as Nos. 18, 26, 28, 45 and 58. In the stomachs of *G. conirostris* (Pl. XI, Fig. 5) most of these same larger seeds were found and also No.

29. *G. fortis* (Pl. XI, Fig. 3) eats such moderately large seeds as Nos. 35, 40, and 48 together with larger ones such as Nos. 28 and 57. An examination of the table will show, however, that the larger-billed species by no means confine themselves to large seeds. It appears most probable that they eat the larger seeds simply because their large bills makes it possible for them to eat a greater variety of seeds. There is no evidence that they show a special preference for large seeds.

The foregoing six propositions are about the only conclusions that we can deduce from a study of the material in hand. It is evident that if these propositions were stated severally as general facts they would be mutually conflicting. Each is true only in some cases.

If it be assumed that the various sizes and shapes of bills amongst the *Geospizæ* have been developed as adaptations to differences in food habit, then it must be shown that the different species of the genus feed on different species of seeds. This cannot be done. We can prove definitely that some species with very different bills feed on exactly the same kinds of seeds. On the other hand some of the evidence seems to indicate that some of the species and subspecies do have different food habits. We cannot say, however, that these differences of diet are not forced upon different species as a result of their living in different localities. Especially is this probable since, in some cases, we find that individuals of the same species living at different localities feed on different seeds. This is due evidently to flora differences between the two regions.

The evidence, then, seems to be in favor of the general conclusion that *there is no correlation between the food and the size and shape of the bill.* If this is true, then we must look elsewhere for an explanation of the variation of the *Geospiza* bill.

A DESCRIPTION OF THE ADULT BLACK MERLIN (*FALCO COLUMBARIUS SUCKLEYI*).

BY FANNIE HARDY ECKSTORM.

ALTHOUGH the young of the Black Merlin was described by Mr. Robert Ridgway twenty-nine years ago and adult specimens have been in collections for upwards of twenty years, by some inadvertency no description of the adult seems ever to have appeared in print. The specimen in my father's collection was declared by no less an authority than Major Charles E. Bendire, who gives at length the story of its capture in his 'Life Histories of North American Birds' (Vol. I, p. 201), to be the finest specimen he ever saw, and because he indicated its fitness to stand as the type of the male in perfect breeding plumage, I have undertaken to supply the deficiency in description.

In his book Major Bendire characterizes the bird as "a very handsome adult specimen," and in a letter written shortly after its capture he again mentions it. As contributing to the history of the specimen but quite as much because it gives to those who did not know him personally some notion of Major Bendire's generosity and his extreme disinclination to leave any room for thanks, no matter what trouble he was at, the whole letter may be quoted.

"Fort Klamath, Oregon, May 13, 1883.

"MY DEAR MR. HARDY:—

Your box of birds left Linkville, Oregon, on the 10th inst. Linkville is the nearest express office from here. I think the charges on it will be between 7 and 8 dollars, something over 50 cts. per pound. Have just received your letter of the 30th ult. It is still wintry here, it has been snowing more or less all day. Robins and Melospizas are just commencing to lay, and other birds will follow I hope in a few days. I shall give up making skins now for awhile. I shot a beautiful ♂ adult *Æsalon columbarius suckleyi* a couple of days ago which I consider one of the best finds I have made here. Much to my surprise I find the California Jay here. I would not have believed it but I shot one of the birds and have it now. Hope to hear that the skins arrived in good order.

Very truly,

CHS. E. BENDIRE."

Not a word here to indicate that this Linkville was sixty miles away, and that he had ridden there in disagreeable weather over roads sure to have been bad to make certain that his gift was safely started, nor that the box contained the bulk of his acquisitions in six months, nor that he contemplated adding this Merlin, the rarest of his recent captures, to a gift already so bountiful as almost to dismay the recipient, who was merely a friend-by-letter. But that was like the Captain.

Falco columbarius suckleyi (Ridgw.), ♂ adult, (collection of Manly Hardy, Brewer, Maine, taken by Capt. Chas. E. Bendire, U. S. A., May 9, 1883. "thirty miles south of Fort Klamath, Oregon, en route to Linkville, in pine timber").

Entire upper parts black, with the gloss of high plumage but without particular iridescence, shaded as follows: head and neck dull black, bend of wing and lesser coverts metallic black, remiges warm brownish black, rectrices dead black, tertials, lower scapulars, middle and greater coverts, rump and upper tail-coverts a clear steel-blue black, bluest on tail-coverts, most ashy on tertials, forming a continuous but restricted mantle, every feather of which shows a heavy black shaft; crown (in high lights only) with a tinge of ashy sufficient to demark a definite crown patch, in other lights nearly concolor with the neck and upper back but showing on every feather a central black stripe which minute examination shows to persist even on the neck where the black is intense enough to all but efface it. A nuchal collar, interrupted and indistinct, formed by buffy-white spots at the bases of the neck feathers, visible where the feathers do not perfectly overlap. Primaries and secondaries narrowly outlined on tips and back edges by a line of buffy brown, the outer webs immaculate, the inner webs showing, though slightly, the sparse light bars of the under side. Tail with a mere trace of white terminal line and four narrow, obsolescent bluish ash bands, the outermost (lying 2.20 in. from tip) so interrupted as to be incomplete on every pair of rectrices, and restricted on the four outer pairs to a V-shaped mark at the centre of the vane; the next band, the last visible below the coverts, whiter, wider and more continuous. Forehead narrowly whitish; a narrow but distinct white superciliary line; sides of head and neck and the throat well down to the point of the breast, white, every feather streaked with black of varying amount and intensity, the black predominating on the lores and maxillary spaces, where it forms a rather indefinite maxillary stripe, and the white being in excess on the throat where it is pure in color and narrowly but decidedly striped, every feather of the middle of the throat showing a black shaft-line and a tiny fan-shaped spot at the tip, and those along the edges of the area being uniformly and rather heavily striped. Breast with the white ground turning to buff and the black, by a change

of the color pattern of the feathers, suddenly predominating, giving the effect of a brownish black body with buff markings, thickest down the axis, each feather of the middle of the breast being black with a buff edge laterally while those toward the sides have the buff restricted to a patch each side of the shaft toward the base. Where the feathers are longest other series of spots appear, sometimes confluent, so that the flank feathers are conspicuously barred twice or thrice with brownish black. The crissum and shorter tail-coverts repeat the pattern of the throat but on a ground of deep buff and with longer, heavier streaks; the ochraceous tibiæ are similarly but more broadly and heavily marked; the longest under tail-coverts show a handsome pattern of hastate black spots on a pale buff ground, the spot being but the irregular terminal of several heavy bars. From below the tail shows the terminal band more clearly and the lowest of the whitish bands, the only one visible below the coverts, is whiter and more regular than on the upper surface. The wings (too tightly closed in this specimen to admit of minute examination) are notably dark beneath, though browner than on the upper surface, show some white upon the under coverts and have five to seven obsolescent whitish bars (rather than spots) on the inner webs of the primaries near the basal half.

Legs yellow; bill horn-blue. Wing, 7.70; tail, 5.30; tarsus, 1.30; bill, .62; depth of bill, .40.

I have not on hand the material to warrant any dogmatic conclusions, but comparing this specimen with a limited number of both *F. columbarius* and *F. richardsoni* one is struck by its evident kinship to the former. Indeed, a large female in high autumnal plumage, taken on the Cranberry Islands, off Mount Desert, Maine, is strikingly like this Black Merlin, being very nearly as dark on the back and two thirds as black below; were it a blue-black instead of a sepia-black it might very well pass for the mate to this male. Between this and *richardsoni*, however, there is an evident gulf, hardly more noticeable in color than in form. *Richardsoni* in all the plumages that I have seen shows a distinct mottled nuchal band, while the nuchal stripe of *columbarius* is much more hidden, a variation of the bases rather than of the extremities of the feathers. In *columbarius* also the maxillary stripe is stronger and more definite and the black line down the centre of the feathers (in *richardsoni* never more than a mere shaft-line) is consistently heavier. *Columbarius* likewise in the younger plumages is more nearly immaculate above and in all shows no spots on the outer webs of the primaries and fewer and

narrower tail-bars. *Richardsoni* in all plumages has wings that are heavily spotted when closed and a tail that is clearly striped with six or seven definite white stripes. *Columbarius*, in the specimens at hand, shows no spots on the outside of the wing when closed and but four to five narrow tail-bars, the terminal black bar (next the white tip) being of extra width. In *suckleyi* these characters are emphasized to a degree, the bird being practically uni-colored above. I speak of these points chiefly to remark the fact that the Black Merlin is, in the adult plumage an intensification of the darker phases of the Pigeon Hawk, but also to call attention to a specimen which Capt. Bendire took at Fort Walla Walla, Wash., and which Mr. Wm. Brewster commented upon in the Nuttall Ornithological Bulletin for Oct., 1882, p. 230. This specimen which presented "a puzzling combination of characters," showed "almost orange chestnut on the breast and tibiæ" and on the back "a nearly pure plumbeous" while "the outer web of all the primaries, excepting the first two, [were] conspicuously marked with rounded spots of pale ochraceous." At this time, Mr. Brewster says, "the adult of *suckleyi* is unknown, but we should expect to find it like the young, with sparse, inconspicuous spotting on the lining of the wings." Even at so late a date as this it may not be untimely to note that Mr. Brewster was entirely correct in his surmise about the adult Black Merlin, and to suggest that the specimen in question seems to combine the characters of the adults of both *suckleyi* and *richardsoni* and may perhaps, if not already accounted for, be explained as one of those not unknown hybrids that give so much difficulty in classifying hawks.

THE NOMENCLATURE AND VALIDITY OF CERTAIN NORTH AMERICAN GALLINÆ.

BY E. W. NELSON.

Plates XIV and XV.

IN 'THE IBIS' for April, 1902 (pp. 233–245), Mr. Ogilvie Grant has a paper entitled 'Remarks on the Species of American Gallinæ recently described and Notes on their Nomenclature.' In this the author gives characteristic expression to a sweeping condemnation of the recent work done in this group by American ornithologists. Among thirty species and subspecies described or revised under old names by American workers since the publication of Mr. Grant's Volume XXII of the 'Catalogue of Birds in the British Museum' in 1893 he considers only four worthy of recognition.

After reading the paper in 'The Ibis' one is prompted to ask if Volume XXII was intended by its author to fix the limit of knowledge in that direction. This is not the first instance, however, in which our critic has differed radically from the views of American ornithologists as shown by his disposal of the commonly recognized subspecies of the Ruffed Grouse, in the cited Vol. XXII.

The tone of absolute finality with which he treats the subject in his recent paper would lead the uninitiated to believe that there could be no appeal from his decisions. In reality, however, in a number of instances they contain such a mixture of misstatement and misrepresentation that they would be unworthy of notice except that they might be accepted at face value by those unfamiliar with the facts. In his recent paper he gives an interesting revelation of the point of view and the methods by which he reaches some of his extraordinary conclusions. No weight is given to the intimate knowledge of the topography and geographic distribution in their territory possessed, usually as the result of years of study and field work, by American ornithologists. On the contrary Mr. Grant appears to approach the subject quite unhampered by any embarrassing knowledge of American geography and to be quite unaware that distribution and varying physical conditions have any real bearing on American ornithology.

This is shown by the confidence with which he makes a comparison of two specimens of the same subspecies from different parts of its range and thereby disproves the existence of another subspecies in quite a distinct and distant faunal area. To render still simpler the process of rejecting species described by American ornithologists our critic does not hesitate to doubt or even deny the existence of characters and specimens not seen by himself.

In 'The Auk' for July, 1902 (pp. 309–311) Dr. J. A. Allen pertinently comments on some of Mr. Grant's remarks concerning various species found north of the Mexican boundary. The following notes are mainly limited to a reply to the strictures on the species described by myself from Mexico. In order to give a clear idea of the basis for my work on the Mexican Gallinæ, so summarily disposed of by Mr. Grant, a few details are necessary.

For about twelve years I have been engaged in a biological survey of Mexico, during which time I have traversed in detail all but an insignificant part of the country. Throughout this period specimens of birds have been collected with the special object of illustrating geographic distribution and variation. Our collection contains about 400 specimens of Mexican Gallinæ, representing all but two or three of the known species, and usually including specimens taken at (or near) the type locality. In studying this material, together with that in the U. S. National Museum, whenever I have found series of specimens from separate districts showing easily recognized differences, and these characters are backed by my personal knowledge that the localities in question are in different faunal areas, my inference has been that the characters thus separating the birds were of specific or subspecific value, as the case might be. During the progress of my work I have constantly consulted Mr. Robert Ridgway who coincides in all of my conclusions regarding the Mexican Gallinæ. Our specimens in this group have also been examined by various other ornithologists who take the same view in the matter. Mr. Grant's condemnation of my work therefore falls with equal force upon the judgment of a number of the best American ornithologists.

Fortunately some of the species treated by my critic have characters sufficiently marked for photographic reproduction, as shown on the accompanying plates.

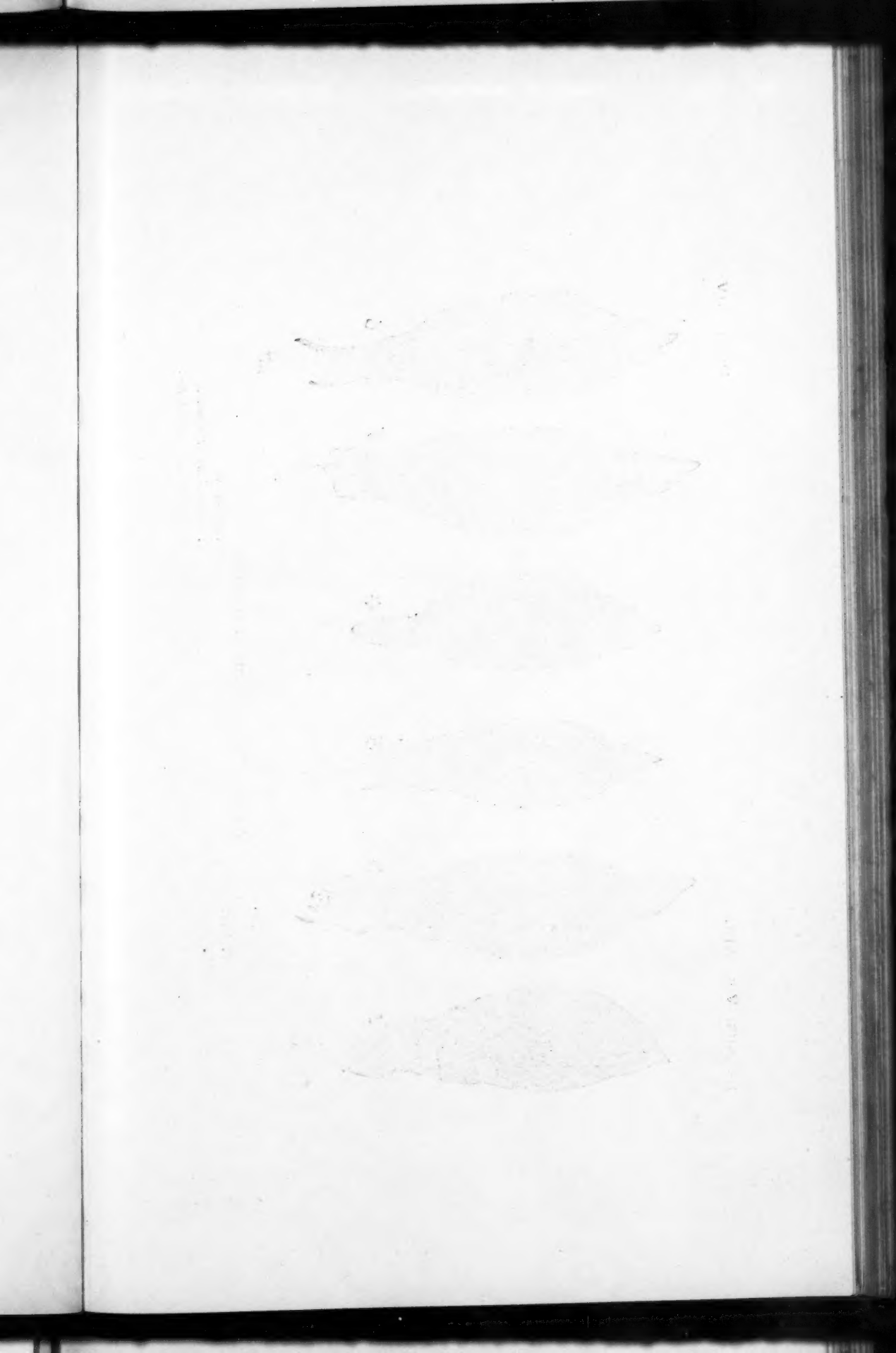
Meleagris gallopavo *Linn.* In reply to my surmise that this name should be referred to the birds which the Spaniards introduced into continental Europe (and which were taken thence to England) probably from the mountains of Vera Cruz, Mr. Grant "cannot see any possible ground for such a supposition," and says "the fact remains that the 'Turkey Cock' figured by Albin in 1740, on which the Linnæan name was founded, can only have been of West or North Mexican origin." To give thus positively the exact origin of the bird from which Albin's crude, diagrammatic figure of a domestic turkey is taken is pure assumption — for Albin says not a word on the subject.

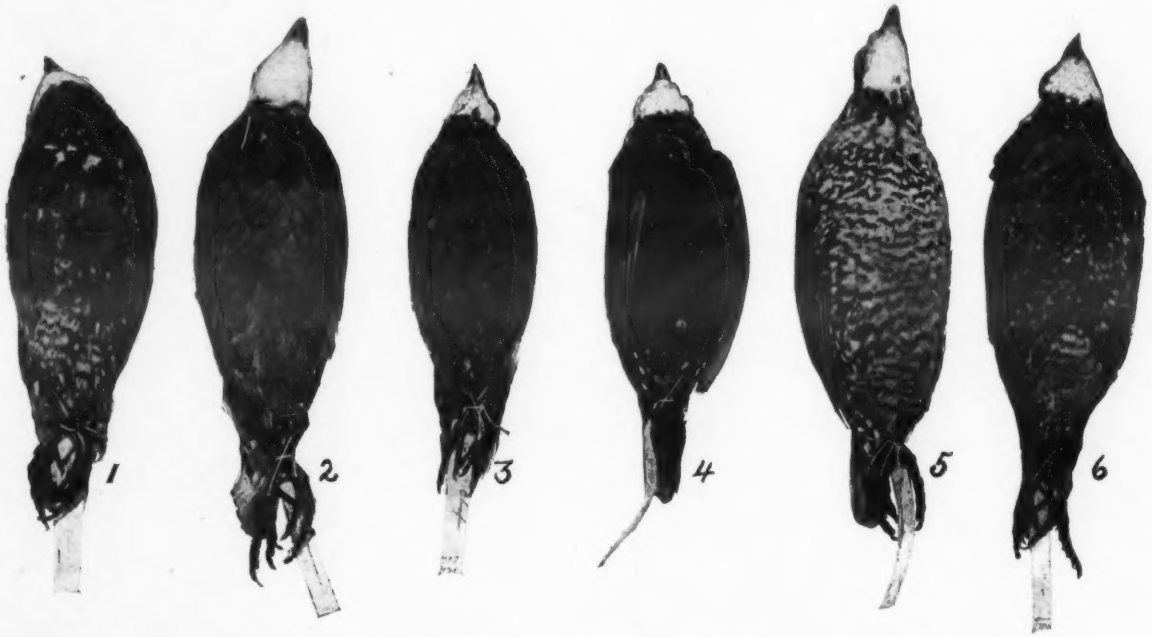
Meleagris gallopavo merriami *Nelson.* Mr. Grant states that by contrasting my specimens of this bird with examples of *M. gallopavo* and *M. americana* and avoiding a comparison with *M. g. intermedia* (with which he says it is "obviously synonymous") I would have it considered very distinct. As a matter of fact I did compare the series of *merriami* with a series of *intermedia* before describing the former, but in the preliminary description only published the results of the comparisons with the two forms with which there was or might have been a possible contiguity of range. *M. g. merriami* and *M. g. intermedia* occupy very distinct faunal areas separated by a broad belt of desert country unsuited to any form of *Meleagris*.

The Committee on Nomenclature of the American Ornithologists' Union has recently compared *M. g. merriami* with its relatives — including *M. g. intermedia* — and found it to be distinct, while Mr. Grant does not claim ever to have seen a specimen of this form.

Dendrortyx oaxacæ, D. macrourus griseipectus, D. macrourus striatus and **D. macrourus dilutus.** Our collection contains twelve specimens of these birds instead of four. Furthermore my familiarity with the region in which the various forms of this bird occur enables me to affirm positively that the differences upon which these birds were described have a definite geographic significance.

Callipepla gambeli fulvipectus. This form is rejected because Mr. Grant has examined a specimen of a female bird from Hermosillo, Sonora, and finds it the same as *C. gambeli!*





SPECIES AND SUBSPECIES OF COLINUS.

1. *C. pectoralis.*
2. *C. graysoni nigripectus.*
3. *C. minor.*
4. *C. godmani.*
5. *C. virginianus texanus.*
6. *C. virginianus maculatus.*

Description of Plate XIV.

Fig. 1. *Colinus pectoralis* (Gould). ♂ from Carrizal, Vera Cruz. Neck and breast with a broad black collar underlaid with much more or less concealed white; rest of underparts to crissum plain *dark* rufous; crissum irregularly marked with black, white and rufous (in some specimens nearly plain rufous).

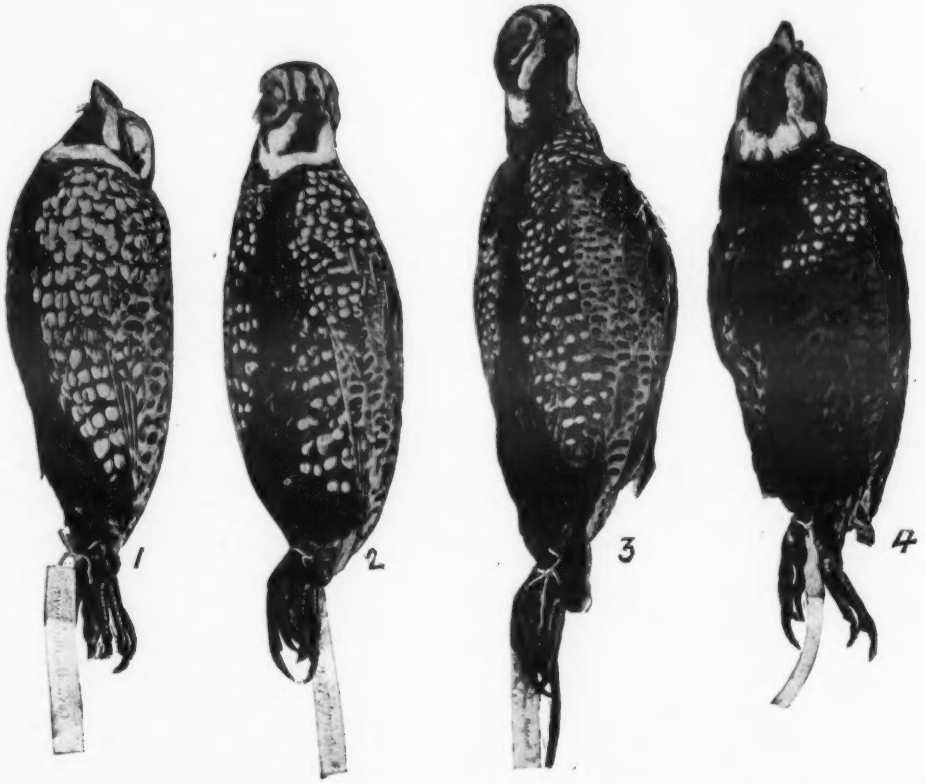
Fig. 2. *Colinus graysoni nigripectus* Nelson. ♂ from Atlixco, Puebla. Decidedly *larger* than *C. pectoralis*; pectoral black collar rather narrower with less concealed white; rest of underparts plain *light* rufous except for a few black and white marks on under tail-coverts.

Fig. 3. *Colinus minor* Nelson. ♂ from Palenque, Chiapas. Decidedly *smaller* than *C. pectoralis* (even smaller than *C. godmani*). Narrow, poorly defined black collar below white throat patch; rest of underparts plain dark rufous clouded with black on borders of feathers, with a few white marks on under tail-coverts.

Fig. 4. *Colinus godmani* Nelson. ♂ from Jaltipan, Vera Cruz. Somewhat larger than *C. minor*; differs mainly from latter in much darker colors, especially below; underparts from throat patch to crissum bright black with some shading of rufous; the black predominating in this bird as the rufous does in *C. minor*.

Fig. 5. *Colinus virginianus texanus* (Lawr.). ♂ from Matamoros, Tamaulipas. White throat patch bordered by a poorly marked, narrow black collar followed by a narrow *pale reddish* pectoral band; most of breast and rest of underparts strongly barred with black and white.

Fig. 6. *Colinus virginianus maculatus* Nelson. ♂ from Atla Mira, Tamaulipas. Size about as in *C. v. texanus*; differs from latter mainly in broader more strongly marked black collar and in having breast and rest of underparts to crissum *dark rufous* spotted and mottled more or less sparingly and posteriorly with black and white.



SPECIES AND SUBSPECIES OF CYRTONYX.

1. *C. montezumæ mearnsi*
2. *C. montezumæ.*
3. *C. merriami.*
4. *C. salliæ.*

Description of Plate XV.

Fig. 1. *Cyrtonyx montezumæ mearnsi* Nelson. ♂ from Chisos Mts., Texas. Differs strikingly from *C. montezumæ* (fig. 2) in paler gray ground color and much larger and more crowded white spots on sides of breast and flanks; dark spots on wings larger.

Fig. 2. *Cyrtonyx montezumæ* (Vigors). ♂ from Irolo, Hidalgo. Sides of breast and flanks dark slate gray with medium sized white spots; wings marked with medium sized, *rounded* dark spots.

Fig. 3. *Cyrtonyx merriami* Nelson. ♂ from east slope of Mt. Orizaba, Vera Cruz. Differs strikingly from *C. montezumæ* and *C. sallæi* in the uninterrupted extension of black throat patch down fore neck, leaving *a white patch on each side of neck in place of usual white collar*; black cheek patch larger and extends down and joins black throat area thus isolating malar white stripe from white area on side of neck; distribution of color on sides of breast and flanks similar to same in *C. montezumæ* but ground color paler gray and white spots smaller; dark marks on distal half of wings larger and *obovate* or *flattened oval.*

Fig. 4. *Cyrtonyx sallæi* Verr. ♂ from Ozolotepec, Oaxaca. White collar on fore neck *complete* and united with white malar stripe; distribution of color on sides of breast similar to same in *C. merriami* and *C. montezumæ*; sides of body back of breast darker slaty than in *merriami with the small white spots of latter replaced with larger, more oblong spots of chestnut*; wings much darker than in *merriami* and *with narrow black bars* in place of rounded spots.

This locality is well within the range of true *C. gambeli.* He has therefore compared typical birds of the same subspecies and concluded that he is "unable to see any reason whatever for separating these birds [*C. g. fulvipectus*] from typical *L. gambeli.*" Just what bearing this comparison has on the validity of a subspecies living at a distance in another faunal area is not plain.

Lophortyx bensoni (*Ridgw.*) (= *Callipepla douglasi bensoni*). Mr. Grant states that he "can find no published description of this species," but on page 404 in volume XXII of the 'Catalogue of Birds in the British Museum' (on the title page of which his name appears as author), under the synonymy of *Lophortyx douglasi*, he will find cited "*Callipepla elegans bensoni* Ridgw. P. U. S. Nat. Mus. X, p. 148 (1887) [Campos, Sonora]." In the place thus referred to he will find an extended description of this well marked geographic race. It is also described in Mr. Ridgway's 'Manual of North American Birds' (1st ed. p. 585; 2d ed. p. 589).

Colinus virginianus maculatus. "We have a series of birds from the area indicated and Mr. Godman and I are both satisfied that Mr. Nelson's name is a mere synonym of the subspecies *C. texanus.*" This decision can only be understood by the supposition that it is another instance of the comparison of birds that have nothing to do with the case. The Biological Survey collection contains over forty specimens of this subspecies which have been compared with about as many of *C. texanus.* The accompanying photograph of typical specimens of *C. v. texanus* and *C. v. maculatus* render further comment unnecessary.

Colinus graysoni nigripectus and **Colinus minor.**[1] Mr.

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[1] Since writing the notes on these birds I have received additional information which appears to affirm conclusively my position. In order to test the correctness of my determination of the small and rather dark birds living along the humid basal slope of the Cordillera in Vera Cruz as *Colinus pectoralis* (Gould) I recently sent two specimens taken at Jico and Carrizal, near Jalapa, in that State to the British Museum for comparison. These specimens I have considered as typical *C. pectoralis*, and a similar specimen from Carrizal is shown over that name in the accompanying plate. With the two specimens of *C. pectoralis* I sent a typical specimen of *C. graysoni nigripectus* from Atlixco, Puebla. Through the kindness of Mr. Oldfield Thomas and Dr. R.

Grant states that "In my opinion there can be no doubt that both these names of Mr. Nelson's are synonyms of *C. pectoralis.*" Fortunately our collection contains specimens of true *C. pectoralis* which inhabits the upper tropical east slope of the Cordillera of Vera Cruz. *C. minor* is a still smaller bird than *C. pectoralis* and lives in the hot lowlands of Chiapas far from the home of the latter. *C. g. nigripectus* lives on the plains of the southern end of the Mexican tableland in southern Puebla and is decidedly larger and paler than *C. pectoralis* and much larger than *C. minor.* The females also show well marked differences. The relative size, and color pattern of the underparts of typical specimens of *C. pectoralis*, *C. minor* and *C. graysoni nigripectus* are shown in the accompanying photograph. The differences shown by these three birds are confined to definitely segregated areas which differ from one another in climatic and other physical characters and have a real geographic significance despite the dictum of Mr. Grant. A specimen of *C. godmani* is photographed with *C. minor* to show the close relationship between them.

Cyrtonyx montezumæ mearnsi. Although Mr. Grant states that neither he nor Mr. Godman have been able to see the slightest grounds for separating this subspecies, yet a series of specimens of typical *C. montezumæ* from the southern end of the Mexican tableland and of *C. m. mearnsi* from the southwestern United States may be distinguished across a room by the large and crowded appearance of the white spots on the under parts of *C. m. mearnsi.* As a matter of course the two forms intergrade but I have never seen a specimen showing the characters of *C. mearnsi* from anywhere about the southern half of the Mexican tableland. The accompanying photograph of typical examples of *C. montezumæ* and *C. mearnsi* show the most striking differences between the two.

Bowdler Sharpe of the British Museum one of Gould's two types of *C. pectoralis* was borrowed from the Liverpool Museum for comparison. During Dr. Sharpe's temporary absence Mr. Thomas writes me that "Your 155523 from Atlixco is decidedly larger and has a larger bill than any of the others [*i. e.*, the type and two specimens from Jico and Carrizal], and those from Jicò and Carrizal more closely match the type, indeed its wing is a shade less than theirs."

Cyrtonyx merriami. The characters of this species are so well marked that in conjunction with my critic's comments, it serves to illustrate strikingly the true value of Mr. Grant's criticism and conclusions. He says that "By almost invariably contrasting his supposed new birds with the species to which they are least nearly allied, 'old friends' are made to appear in the guise of very distinct species. We cannot imagine that so excellent a field-naturalist as Mr. Nelson does this wilfully, and must therefore infer that such errors are due to insufficient knowledge of the subject and want of material. By referring to the various 'keys to the species' in the 'Catalogue of Birds,' XXII, Mr. Nelson would have escaped such absurdities as redescribing *Cyrtonyx sallæi* under the name of *C. merriami* and comparing it with *C. montezumæ*!!" "There can be no doubt that *C. merriami* is a synonym of the beautiful species described in 1859 as *C. sallæi.*" The foregoing authoritative disposal of *C. merriami* made me almost fear that Mr. Grant held the power to make the 'tiger change its spots.' On examination of the type of *C. merriami* however I find that the color characters between it, *C. montezumæ* and *C. sallæi*, are such that a photograph brings out some of the most salient differences. After examining the accompanying photographs of these birds I think that any competent ornithologist will admit that I was justified in the "absurdity" of describing *C. merriami* as distinct and in comparing it with its nearest relative *C. montezumæ*, even after consulting the "keys to the species" in the 'Catalogue of Birds, XXII.'

Dactylortyx. While admitting that my revision of this genus was done on scanty material I see no reason for considering myself in error in describing *D. chiapensis* and *D. devius.* That Mr. Ogilvie Grant cannot find any differences in a series of 23 specimens in the British Museum, in the light of his recent utterances, is not at all surprising and really would not appear to have any bearing on the facts in the case.

A HYBRID BETWEEN THE CLIFF AND TREE SWALLOWS.

BY FRANK M. CHAPMAN.

THE American Museum of Natural History has recently acquired from the collector what seems to be a hybrid between *Petrochelidon lunifrons* and *Tachycineta bicolor*. The specimen (No. 78,119 Springfield, Mass., Aug. 20, 1902, Leon C. Holcomb) is apparently a bird of the year and, in addition to presenting evidences of hybridism, exhibits also albinistic characters, though it is possible the latter may be a result of hybridity. Generally speaking this specimen resembles *bicolor* below and *lunifrons* above, the rusty and buff markings of the last named species, however, being, in this supposed hybrid, white. A more definite understanding of this interesting bird's color and markings may be gathered from the appended comparative tables:

FORM.

T. bicolor. ♂ im.	*Hybrid.* ♂ im.	*P. lunifrons.* ♂ im.
Bill.		
Medium; width at nostril 4.5 mm. Nostril elliptical; a well-developed operculum.	Medium; width at nostril 4.5 mm. Nostril circular; a well-developed operculum.	Rather heavy and broad; width at nostril 6.3 m. Nostril circular; no operculum.
Wing.		
Long, 118 mm.	Short, 103 mm.	Medium, 105 mm.
Tail.		
Medium, 50 mm.; fork, 9 mm. deep.	Short, 40 mm.; fork, 4 mm. deep.	Medium, 45 mm.; fork, 2 mm. deep.
Feet.		
Slender, tarsus 11 mm.; middle-toe, 11 mm.; nail, 4 mm.	Medium, tarsus, 11 mm.; middle-toe, 11 mm.; nail, 3 mm.	Rather stout, tarsus, 11 mm.; middle-toe, 11 mm.; nail, 5 mm.

COLOR.

T. bicolor. ♂ im.	*Hybrid.* ♂ im.	*P. lunifrons.* ♂ im.
	Under parts.	
White, sides of breast dusky sometimes forming a faint breast band.	White, a well-defined dusky breast band; left side of throat and abdomen washed with yellow.	Throat dusky black more or less mixed with cinnamon and, usually, whitish; breast and sides dusky washed with rufous.
	Under wing-coverts.	
Dusky, bend of wing whitish.	White, bend of wing partly yellow.	Dusky washed with rufous or cinnamon.
	Under tail-coverts.	
White.	White.	Mixed dusky and rufous or cinnamon.
	Upper parts.	
Uniform dusky slate or grayish brown.	Forehead white, a faint yellowish tinge; pileum sooty black with slight steel-blue reflections; a well marked nuchal collar white faintly tinged with dusky and yellow; back like pileum the feathers basally white; rump white, slightly tinged with yellow anteriorly.	Forehead cinnamon, usually mixed with dusky and sometimes white; pileum dusky black with slight steel-blue reflections; nuchal collar grayish brown, back somewhat paler than pileum, tipped with buffy, rump ochraceous buff.
	Upper tail-coverts.	
Dusky slate or grayish brown.	White tipped with fuscous.	Grayish brown, edged with buffy.
	Tail.	
Dusky slate or grayish brown.	Fuscous, inner web of outer feather white, except at end; outer web of three outer feathers edged with whitish.	Grayish brown faintly iridescent, with indications of a white terminal mark on the inner web of the outer feather.

Wings.

Dusky slate or grayish brown, inner tertials lightly edged with white.	Fuscous, tertials faintly edged with whitish.	Grayish brown faintly iridescent, the coverts slightly, tertials more widely, margined with buffy or ochraceous.

It is of course well known that in the Tree Swallow both birds of the year and adults moult before leaving us for the South while the Cliff Swallow migrates before moulting. It is consequently of interest to observe that in this hybrid moult has begun normally with the innermost primaries.

This fact is also of importance in determining the bird's age and, in connection with the unworn condition of the wing-feathers, it leaves no doubt that the specimen is in post-natal plumage.

The radical differences in the character of the nests of the supposed parents of this bird lead one to speculate on the type of nest-structure in which it was reared, but, unfortunately, our curiosity in this direction cannot be gratified.

GENERAL NOTES.

The Arctic Tern in Hawaii. — When shooting in the low, brackish-water marshes at Kahuku, on the island of Oahu, on April 30, 1902, Manuel Silva, a Portuguese boy of my acquaintance, shot a fine male specimen of *Sterna paradisæa* in full spring plumage. I secured the bird for the Bishop Museum. It had the bill and feet rich carmine when freshly killed and from it I took the following measurements: Length, 15.25; wing, 11.50; culmen, 1.20; tarsus, .47; middle toe and claw, .91; tail, 7.25.

The boy said that it was the only one of the kind that he saw, and it being a stranger to him he spent much time in pursuit of it and was fortunate enough to secure it by a chance shot. The bird was in good flesh and exhibited no signs of having experienced any very severe hardship in reaching this Territory.

This is the second specimen of this species which has been reported from the Hawaiian Islands, one having been taken eleven years before by Mr. R. T. Guarde at Hilo on Hawaii, as reported by Mr. Henshaw in 'The

Auk' for April, 1902. Both birds were evidently on their spring northerly migration and were lost at sea and wandered here by accident. — Wm. Alanson Bryan, *Bishop Museum, Honolulu, H. I.*

The Occurrence of Boobies in Numbers on the East Coast of Florida, during a Storm. — Two white Boobies (*Sula cyanops* and *S. piscator*) are given in the A. O. U. Check-List as occasional visitants to the Florida coast, but as actual records are meagre it is, perhaps, worth while to publish an account of a day, during a terrific storm, when I saw a species of small white booby in company with the Common Booby (*Sula sula*) fishing in large numbers off the beach of the East Peninsula. Unfortunately I was not able to secure a specimen or positively identify the species, though I feel sure it was *S. piscator* (or possibly *S. coryi* Maynard, if that bird is really distinct).

On February 12, 1895, occurred the second terrible 'freeze' of that memorable winter. At the time I was at Oak Lodge, on the East Peninsula of the Indian River, opposite Micco. For several days thereafter the weather continued to be very cold and unsettled, with high winds that drove the water out of the Indian River to such an extent that it was impossible to cross it in a boat, and culminated on Feb. 16, in a northeasterly gale accompanied by rain, of a violence seldom attained on the east coast of Florida in winter. About 10 o'clock of that morning (Feb. 16, 1895) Mrs. Latham came into the workshop where I was skinning my morning's catch, thankful to be indoors again out of the storm, and told me she had just been at the beach and had seen a great many birds there, among them what she thought were Gannets, fishing in the breakers. I instantly took my gun and started along the trail through the palmetto hummock, fighting my way foot by foot against the fury of the wind and rain. On arriving at the beach I was greeted by the wildest scene imaginable ; huge breakers were rolling in over the shallow water and falling on the beach with tremendous noise ; the rain, driven by the gale, came in sheets, but in spite of it the cutting white sand was blown with such force against my face and hands, that I had repeatedly to turn my back to the storm.

Vast numbers of Herring Gulls, Royal Terns and Bonaparte's Gulls sat huddled together in bunches on the upper beach, not daring to trust themselves to the elements. These great gatherings of gulls were very tame and allowed me to walk up close to them, and when they did take wing skimmed only a short distance along the crest of the beach and lit again, huddled together as before.

High up overhead an occasional Frigate Bird swept by on motionless wings, cutting directly into the teeth of the gale, or driving before it with apparent indifference. The stolid Pelicans, unmoved by the storm, proceeded as usual up and down the line of breakers, in little companies, with the same measured flight as in the finest weather, rising and falling as the huge breakers rolled under them.

But to me most interesting of all was a sight I had never before witnessed on the beach, although I had visited it every day; — as far as the eye could reach, up and down the line of surf, were great numbers of boobies flying back and forth and every now and then collecting over some school of small fish and diving from a height like a party of boys following each other off a spring-board. There were hundreds, perhaps thousands, of them. There were probably but two species, though of three styles of coloration. A comparatively small number were adults of the Common Booby (*Sula sula*), easily identified by their brown backs and heads and white bellies; next in numbers were young birds in wholly grayish brown plumage, but outnumbering both these together was a small white species with conspicuous blackish flight feathers. All these were of about one size.

For two hours I lay flat on the beach hoping to get a shot, but though the boobies came often to within a hundred yards of me and sometimes gathered together and fished in front of where I lay, none came quite close enough to shoot, keeping just outside the breakers. At the end of this time they began gradually, in small parties, to fly out to sea, till all had gone. From the way these birds behaved I do not think they were driven in by stress of weather, because all the time they were off the beach they were very busy fishing, and when they had done they gradually left again flying out to sea though the storm had not abated. It is my opinion, rather, that the boobies know by experience that during such a storm there is good fishing on the east Florida beach and come there to enjoy it.

While such records as this, where the species are not positively identified by the taking of specimens, are unsatisfactory in the extreme, yet this one, perhaps, is worth publishing as showing that the smaller boobies do sometimes visit the coast of east Florida in large numbers. Moreover, I am sure the white bird was *Sula piscator*; had it been *S. cyanops* I could not have failed to notice the larger size compared with the Common Booby, as I often saw them directly side by side. — OUTRAM BANGS, *Boston, Mass.*

Ardea cærulea again seen in Ohio.— On July 2, 1902, a beautiful specimen of this species was again seen along the canal (Portsmouth–Lake Erie Canal) near Waverly; it was so unsuspicious, that it allowed buggies to pass within a distance of twenty feet and a mistake in identification was excluded. As I had to move north a few days later, I could not observe the species any length of time. The early date this year seems to strengthen the opinion expressed last year, that this bird may breed in southern Ohio.— W. F. HENNINGER, *Waverly, Ohio.*

The Yellow-crowned Night Heron (*Nycticorax violaceus*) in Nova Scotia.— It may be of interest to report that on Tuesday, April 1, 1902, while walking through the Quincy Market in Boston, I found in the

stall of F. H. Hosmer & Co. a female Yellow-crowned Night Heron, in full nuptial plumage, and in a remarkably fresh state of preservation, which had been received on the previous Saturday in a shipment of birds from Yarmouth, N. S.

On looking the matter up, I found that it had been shipped by Mr. Howard Smith of Hawks Point, Cape Sable Island, and had been killed somewhere in that vicinity by Mr. R. C. Maxwell of Lower Clark's Harbor, Shelburne County, Cape Sable Island. I had a letter from Mr. Maxwell in which he told me of his killing the bird, and another from Mr. Smith, in which he writes, among other things, under date of April 21, as follows: —

"Since receiving your letter, I have learned through a friend of mine, Mr. I. K. Doane, lighthouse keeper at this place, that two other specimens of this bird have been captured this spring in our neighboring county, viz. Yarmouth, and are now mounted and on exhibition in the store of Benjamin Doane, taxidermist, Yarmouth, N. S."

It seems from this interesting information that at least three birds of this species had wandered this far north during the spring migration.— FRED. H. KENNARD, *Boston, Mass.*

The Authority for the Name Geotrygon chrysia.— In the Eighth Supplement to the Check-List, Auk, Jan., 1897, p. 126, the authority for the name *Geotrygon chrysia* is credited to Bonaparte, Consp. Av. II, 1854, 72, where it only occurs in the synonymy of *Geotrygon martinica*. Bonaparte, Comptes Rendus, XL, 1855, 100, says that he has in his esteemed correspondence "the name *Geotrygon chrysia*, a species still more brilliant and coming from the same countries as *montana*." This he considers to be the same as *Geotrygon martinica* and says that M. Castelnau, following the records of the Museum, finds it reported from Florida. It seems to me that this description is not sufficient to fix the name, and that the proper authority for *Geotrygon chrysia* should be Salvadori, Cat. Bds. Brit. Mus., XXI, 1893, 571.— J. H. RILEY, *Washington, D. C.*

The Black Vulture (*Catharista urubu*) in Virginia.— The A. O. U. Check-List gives the regular range of the Black Vulture (*Catharista atrata*) as reaching its most northern point in North Carolina. I have now to record that this vulture occurs regularly in Nansemond County, Virginia, where it is a not uncommon summer resident. Here it is known as the 'South Carolina Buzzard,' and it is usual to find it in company with Turkey Vultures (*Cathartes aura*), from which its smaller size and its quicker, more broken flight distinguish it at a glance. On the edge of the Dismal Swamp, along Cohoon Creek, near Suffolk, Nansemond Co., Virginia, May 19, 1902, it was noted as quite abundant, seven individuals being seen upon one occasion. The regular range of this species is thus extended northward to Nansemond County in Virginia, probably including

the contiguous counties of Norfolk and Princess Anne, and thus extending to the northern limit of the Austroriparian subprovince.— JOHN W. DANIEL, JR., *Washington, D. C.*

The Proper Name for the Western Sparrow Hawk.— Since Dr. E. A. Mearns, U. S. A., published his review of the American Sparrow Hawks in 'The Auk' for July, 1892, pp. 263–265, the Sparrow Hawk of the western United States, and the west coast of Mexico to Mazatlan, has been commonly known to ornithologists as *Falco sparverius deserticolus* Mearns. Our work in Mexico has shown that this bird ranges along the entire Pacific coast of Mexico as well as over most of the remainder of that country. The Western Sparrow Hawk appears to be the only form found along the west coast of Mexico (exclusive of Lower California) north of the Isthmus of Tehuantepec.

Dr. Chas. W. Richmond, Assistant Curator of Birds, U. S. National Museum, recently handed me volume XX of the Lévêque edition of Buffon's works with the remark that it contained descriptions of some Mexican birds by Lesson. In looking through these I found under the heading of *Tinnunculus phalæna* Lesson, a careful description of male sparrow hawks from San Blas [Tepic] and Acapulco [Guerrero], Mexico. These places are within the ordinary range of the Western Sparrow Hawk, to which Lesson's description unquestionably refers. This being the case, the name *Falco sparverius deserticolus* Mearns becomes a synonym of *Falco sparverius phalæna* (Lesson) in Buffon, Œuvres, Vol. XX, Lévêque ed. 1847 (suppl.), pp. 178–179.— E. W. NELSON, *Biological Survey, Washington, D. C.*

The Barn Owl on Long Island.— From Doctor Braislin's 'Notes concerning certain Birds of Long Island,' published in the July number of 'The Auk', I am led to infer that there has heretofore been some doubt about the presence of the Barn Owl on our island. It may be of interest to Doctor Braislin to know that a pair of these owls formerly inhabited the steeple of the Congregational Church on the corner of Lincoln Street and Browne Avenue, Flushing. For many years I knew of their presence there, but did not divulge the secret for fear that they might be driven away by the church people. No doubt they would still be there had not the church been overhauled and new glass put into the steeple sash where the birds were wont to enter. The owls shared the steeple with a colony of pigeons and brought muskrats and other small mammals to their young, although there were fat young squabs within reach.

Mr. Langdon Gibson, brother of Chas. Dana Gibson the artist, was also aware of the presence of the Barn Owls in the Congregational spire. Gibson was then a lad and he climbed up to the nest securing *two young owls*, if I remember aright; at any rate, he brought me one which I kept for some time and from it I made a number of drawings and still have

them in my portfolio. Of all the creatures I have ever sketched there are none so absurdly comical in looks and action as young Barn Owls, and I can well understand the cause of the popular name of 'Monkey-faced Owl' applied to these white-faced, beady-eyed young imps.— DAN. BEARD, *Flushing, N. Y.*

Nesting of the Hawaiian Owl (*Asio accipitrinus sandvicensis*) on Oahu, H. I.— Although the Pueo, which was worshiped and feared as a god by the ancient Hawaiians, has long been known to be a resident of the principal islands of the Hawaiian group — so long indeed that the hardship and isolation which it has suffered has reduced it quite perceptibly in size — I here append the first information on its nidification which has been recorded from this Territory.

On November 20, 1901, Dr. Geo. H. Huddy brought to me at the Bishop Museum a very young owl which he informed me was one of four he had secured from the nest, which was not far distant from his country home in Kalihi Valley on the Island of Oahu. The bird was alive, though in a dying condition, when it was presented to the museum, and little time was lost in securing a photograph of his owl-ship before he succumbed to the inevitable, for it seemed out of condition from the first and was with much difficulty induced to take food. The specimen (Museum No. 10213) was in the first downy plumage, the wing quills not having burst the capsules. The eyes were a very light straw-yellow; the bill and claws dark horn color.

The following day the Doctor and his servant (who had accidentally discovered the nest three or four days previous to our visit) conducted me to the spot where the young birds were secured. It was located in a rough grass and fern-grown path running along the steep mountain side, half way up from the valley below, and approximately 800 feet above the sea. No attempt at concealing the nest had been made — in fact, little had been attempted in the line of nest making; it was simply a very shallow platform, composed of the surrounding grasses, placed in a slight depression and befouled with the regurgitated masses of hair and bones of small rodents. The nest and such of the accessories as were available were carefully removed and will form a part of a group in the museum, for which object my friend generously added two more of the three birds which he was keeping as pets, reserving only the largest, strongest bird for himself, which he has had no trouble in bringing to its full growth on a diet of beef, with a rat or mouse added from time to time by way of variety.

The popular notion among the natives seems to be that this owl nests in holes or caves in the cliffs, a belief which the foregoing does not bear out. The situation chosen by the parent birds in this instance was an adaptation of the local conditions to the habits and requirements of the American Short-eared Owl, which is the undoubted progenitor of the Hawaiian subspecies.—WM. ALANSON BRYAN, *Bishop Museum, Honolulu, H. I.*

Further Notes on the Snowy Owl in Ontario. — Since my letter of March 3, 1902, was published by Mr. Ruthven Deane, in his paper on the Snowy Owl, in the July 'Auk,' further information has made it evident that the migration in Ontario was a much more extensive one than I had at first imagined. During March the females disappeared and were replaced in April by the returning flight of light colored birds (males, as far as I was able to examine). A few remained about Toronto Marsh all through May, and a small light colored male was taken on June 7. It was in excellent condition and showed no trace of being a wounded bird.

Estimate of the number killed. — It soon became apparent that this migration was no ordinary flight as regards numbers, and as answers to my enquiries came in I saw that some other means of counting heads was necessary. I then had recourse to the number of artificial owl eyes used in Ontario during the migration. I was greatly helped by two facts; first, the almost total absence of Horned Owls from Ontario, or at least the territory affected by the migration, and was thus able to eliminate the possibility of many of the eyes being used for Horned Owls; secondly, nine-tenths of the eyes used by taxidermists, amateur or professional, in Ontario are bought from three firms in Toronto. In one case I went over all the orders and checked off the owl eyes; in another I got a careful estimate, and in the third I estimated the number from information as to the extra eyes imported to meet the demand. I found that not less than five hundred pairs of large owl eyes were sold in Ontario during this migration; and I believe the figure to be a low one, for not only were the regular sizes exhausted, but any yellow eye that could be made to do duty was used. From what I heard and saw I believe that less than half of the owls killed were mounted; and in going over the matter with Dr. Wm. Brodie I found that he too had concluded that one thousand was within the mark, though on different grounds. — J. H. FLEMING, *Toronto, Ontario.*

An Addition to the Avifauna of Virginia. — In a collection of birds made during May, 1902, by the writer, in the Lake Drummond region of the Dismal Swamp, there is a specimen of Hairy Woodpecker which proves to be typical of the southern subspecies, *Dryobates villosus audubonii* (Swains.). Mr. William Palmer very kindly compared the specimen (♂ ad., taken May 22, 1902, Washington ditch, ½ mile northwest of Lake Drummond, Dismal Swamp, Nansemond County, Virginia; field number 32, coll. of J. W. D. Jr., Washington, D. C.) with material in the National Museum, and pronounces it referable to the southern race. Hitherto this form has not been taken further north than North Carolina. — JOHN W. DANIEL, JR., *Washington, D. C.*

A new Foster-parent of the Cowbird. — On April 28, 1902, I found in an old log cabin a nest of Bewick's Wren, containing five fresh eggs of the owner and one fresh egg of the Cowbird. This species I do not find mentioned in any book, not even the late Maj. Chas. E. Bendire's monu-

mental work, as a foster-parent of the Cowbird. The nest in question was found in the southern part of Ross Co., Ohio, was photographed and the entire set collected.— W. F. HENNINGER, *Waverly, Ohio.*

The White-throated Warbler at Ann Arbor, Michigan.— I took a specimen of the rare White-throated or Brewster's Warbler (*Helminthophila leucobronchialis*) near Ann Arbor, Mich., May 18, 1902. It is an adult male, rather larger than either *H. pinus* or *H. chrysoptera*, and much different from either in coloration. We have no other record for this county, and only two for *H. pinus*, but *H. chrysoptera* nests here quite commonly.— NORMAN A. WOOD, *Ann Arbor, Mich.*

The Coloration and Relationships of Brewster's Warbler.— Brewster's Warbler (*Helminthophila leucobronchialis*) is invariably described as having a white breast more or less strongly washed with yellow; this tinge being reduced to the minimum, but still always present, in so-called typical examples.

I hope to prove that in pure plumage this bird has the under parts *absolutely* white, and that the slightest trace of yellow in the breast-feathers brands a specimen as intermediate between *leucobronchialis* and *pinus*. It is well known that these extremes are connected by a perfect chain of intermediates, and that the frequency of occurrence of these intermediates is, if we count them all as *leucobronchialis*, in inverse ratio to the purity of their coloring. (A fact, by the way, which points strongly to the belief that *leucobronchialis* is a mere variation of *pinus*.)

Whitish-breasted and more or less golden-winged examples of *pinus* are, comparatively speaking, not rare, but the *leucobronchialis* end of the gradation is meagerly represented by specimens — so meagerly, in fact, that ornithologists have apparently failed to get a clear idea of what it really is. Now since this gradation is from a bright-yellow-breasted, green-backed, *toward a pure-white-breasted, gray-backed bird*, the assumption that it certainly stops *just* short of attainment of the latter extreme would be absurd, even if there were no specimens to contradict it. There is, however, at least one such specimen. A Brewster's Warbler which I shot at Beltsville, Maryland, in May several years ago, and which is now in the Smithsonian collection, has all the white of the under surface exactly as pure and ashy, and the gray of the back as clear and as sharply defined against the yellow crown, as the best examples of *H. chrysoptera*. Of course a discrimination between pure white and very slightly tinged white can only be made by experts, and it was as experts that my father and I, both of us artists, examined this specimen with a view to testing this very point. When the bird was fresh, there was no slightest trace of yellow in its breast, on or below the surface of the feathers; but this purity of coloring has been marred by a most unfortunate accident. The breast was torn in skinning, and grease has exuded on to the feathers,

making a patch of buff-colored stain that would be mistaken for the prescribed yellow wash by any but a very close observer. This, however, might perhaps be removed with turpentine.

When it has been proved that Brewster's Warbler does, as was to be expected, achieve a perfectly pure coloration, it is obvious that the description of true Brewster's Warbler should be taken from a bird thus purely colored. For, granted that it is sometimes entirely white-breasted, it would be exactly as rational to take as a type a strongly yellow-tinged specimen, or one from any point in the gradation toward *pinus*, as one with a faint, concealed yellow wash.

The extreme form is of course the best representative of this obscure race; and the form best representing the race is, except in the narrow technical significance of the word, most *typical*.

There is another point which does not seem to have received due consideration in discussion about Brewster's Warbler. It is the fact that, though the bird is most generally believed to be a hybrid between *pinus* and *chrysoptera*, and the gradation between the former and pure *leucobronchialis* is cited as corroborative of this theory, there are absolutely no intergrades between pure *leucobronchialis* and *chrysoptera*. Until such specimens are found, the evidence in favor of this view is at best extremely incomplete. On the other hand, there are several points that tell against it, and one of the most important of these is the existence of Lawrence's Warbler. This bird is very evidently a hybrid between the two common species already mentioned, and is itself extremely rare, as such a hybrid would naturally be.

Typical specimens are nearer in general aspect to *pinus* than to *chrysoptera*, though they have the black head-markings of the latter; and the remarkable parti-colored bird shown at a recent meeting of the A. O. U. is intermediate between *lawrencei* and *chrysoptera*; while none of these shows any affinity with any plumage of *leucobronchialis*, which has always a light throat and a *narrow* black eye-line.

It seems scarcely possible that two species of Warbler should produce together two perfectly distinct types of hybrid. If it depended on which species furnished the male parent, one type of offspring could only be much commoner than the other if one combination of parents were much commoner or more prolific, which in this case seems very unlikely.

All this leads one to believe that Brewster's Warbler is either a distinct species whose normal habitat has yet to be discovered, but whose hybrids with the Blue-winged Yellow have frequently been found, or that it is an independent color-phase of the latter species.

This last explanation seems to me by far the most plausible of all.— GERALD H. THAYER, *Monadnock, N. H.*

Rare Birds for Eastern Long Island, New York. — Two Summer Tanagers (*Piranga erythromelas*) were seen, and one taken on the 9th of April, 1902. The specimen taken was somewhat emaciated, but the

plumage was in fine condition. The early date seems to carry out the theory of Dr. Braislin, "that these birds were driven off shore far to the south by storms."

On my return from a fishing trip on July 28, the first day this summer, by the way, that I had failed to carry my gun, I saw a Lark Sparrow (*Chondestes grammacus*) in the road searching for grain among the horse droppings. The bird seemed to be very reluctant about leaving this spot, and I came near knocking it over with my fishing rod. The broadly white-tipped tail feathers were very conspicuous as the bird flitted about within about twenty feet of me.—W. W. WORTHINGTON, *Shelter Island Heights, N. Y.*

Notes and Additions to 'Birds of Parry Sound and Muskoka.'—Through the kindness of Professor John Macoun of the Geological Survey, Ottawa, I have been allowed to make use of the notes made by his assistant, Mr. William Spreadborough, during the summer of 1900, in the Algonquin National Park, Ontario. Mr. Spreadborough was at Cache Lake, on the Canada Atlantic R. R., forty-seven miles east of Scotia Junction, from May 25 to June 17, and in various other parts of the Park till August 31. The altitude of Cache Lake is said to be 1837 feet, very much higher than any point in Parry Sound or Muskoka, and the highest point of the watershed. Eighty-nine species were recorded, two of which are not included in my list, namely:—

Totanus flavipes. YELLOW-LEGS.—One observed August 31.

Melospiza lincolnii. LINCOLN'S SPARROW.—One shot at Cache Lake July 11.

The following are of interest.

Merganser cucullatus. An old one and four young seen July 6.

Fulica americana. A pair breeding on the Madawaska River.

Melospiza georgiana. Abundant in the marsh below Cache Lake.

Seiurus noveboracensis. Common everywhere in flooded woods at the margins of the lakes.

I have also the following additional species to record.

Chen cærulescens. BLUE GOOSE.—One taken at Gravenhurst, Muskoka, about 1886, now in the possession of Mr. Wm. Johns, Gravenhurst.

Oidemia deglandi. WHITE-WINGED SCOTER.—Mr. Wm. Spreadborough reports having seen two on Lake Muskoka, in September, 1899.

Ardea egretta. AMERICAN EGRET.—Ernest Seton has recorded one taken at Lake Nipissing in 1883 (Auk, II, p. 336).

Porzana carolina. SORA.—Mr. Spreadborough reports Soras as being far more common than the Virginia Rail near Bracebridge, Muskoka. A Sora was picked up alive at Emsdale in October, 1901, and sent to me.

Petrochelidon lunifrons. CLIFF SWALLOW.—Mr. Spreadborough reports this swallow as breeding in the township of Draper, Muskoka.

Ammodramus henslowii. HENSLOW'S SPARROW.—I was surprised to find this sparrow on Lake Joseph and apparently breeding. I first

noticed it on July 14, 1902, in a hay field about a mile from Port Sandfield, and for some days had every opportunity of watching the males as they sat on the fence and uttered their rather wheezy note. Two or more pairs were in the one field, and I could find none in any of the few likely places elsewhere.—J. H. FLEMING, *Toronto, Ontario.*

Notes on the Summer Birds of Berkshire County, Massachusetts.— I spent the week of June 17–22, 1902, in Williamstown and vicinity with Mr. Louis Agassiz Shaw, making some observations perhaps of value to those interested in the Berkshire County avifauna. My notes are supplemented by the notes of Messrs. Francis G. and Maurice C. Blake who were residents of Williamstown during the years 1900 and 1901.

The weather while we were there was cool and rainy days alternated with cloudless ones.

Bartramia longicauda. Five pairs or so were found evidently breeding on Northwest Hill, and two pairs on the Vermont (Pownal) line. Four specimens were taken (three males and one female), all adults, but with the sexual organs little enlarged. They were in the upland meadows in fairly tall grass (eight inches), and when flushed lit on barns, fences or trees. On the 21st, a rainy day, they were heard not only to utter their common call note, but a prolonged wind-like whistle — sounding like an eolian harp — which can best be represented thus: *phue-phue-phue- phue phue phue, phue-phue-phue,* uttered as they sailed like hawks above the meadows, or while perching. The Messrs. Blake tell me they saw four on June 19, 1900, and two June 15, 1901, near Stone Hill. In the first instance they were heard 'singing.' Although breeding in the Western States in May and early June, I believe they do not begin to nest in Massachusetts until after the middle of June.

Colaptes auratus luteus. Noticeably uncommon; only nine birds were observed during our stay.

Otocorys alpestris praticola. Several pairs were found breeding on Northwest Hill (1000 ft.). They were seen feeding in the roads, on the ploughed lands, and in the long grass meadows. One was heard singing from the ridge-pole of a barn. The song consists of a few notes, followed by a rising, rolling trill, ending with a few single notes. It is unpretentious, but sweet.

Cyanocitta cristata. Also noticeably uncommon. The only birds heard were on Greylock and in the Hopper, three individuals altogether.

Ammodramus henslowii. Common about Williamstown, in wet meadows grown up with the steeple-bush (*Spiræa tomentosa*). In Norwood, Massachusetts, a meadow they inhabit is grown with sedges (*Scirpus atrocinctus, Carex monile, bullata, flava, scoparia*), red-top (*Agrostis alba vulgaris,* fowl-meadow grass (*Poa serotina*), and rush *Juncus effusus* — species kindly identified by Mr. Walter Deane); and Mr. G. M. Allen tells me the white hellebore (*Veratrum viride*) was the principal growth in a meadow where he once found them in New

Hampshire. We found several pairs on the east slope of Stone Hill, and quite a colony on the western slope of Northwest Hill on both the Massachusetts and Vermont (Pownal) side of the State line.

Ammodramus savannarum passerinus. One pair found on the east slope of Northwest Hill in Williamstown.

Vireo flavifrons. This species and *V. gilvus* were heard in the village of Williamstown, and the former also at South Williamstown.

Dendroica æstiva. A single bird was heard singing on Mt. Greylock at 2500 feet elevation.

Cistothorus palustris. A pair were found inhabiting a small flag-grown meadow brook in Hoosac Swamp in Williamstown (600 ft.). Pontoosuc Lake is the only other locality in the county from which they have been recorded.

Hylocichla aliciæ bicknelli. One heard calling on the summit of Mt. Greylock on the 18th.

Hylocichla guttata pallasii. One heard singing on the Greylock range.

Hylocichla mustelina. One pair found about the meadow in the Hoosac Swamp in Williamstown among some alders, and others were heard singing on the side of Mt. Greylock at 2800 feet elevation.

Sialia sialis. Exceedingly abundant in the low country. — REGINALD HEBER HOWE, JR., *Longwood, Mass.*

RECENT LITERATURE.

Grinnell's 'Check-List of California Birds.' [1] — Mr. Grinnell's 'Check-List of California Birds' has evidently been prepared with care and gives a large amount of information in a condensed form about the manner of occurrence of California birds within the State of California. The list numbers 491 species and subspecies, with an additional 'Hypothetical List' of 33 species "ascribed to California, but concerning which there is doubt either as to the evidence of their occurrence or as to their validity as species." Doubtless many of these will be later added to the fauna of the State through positive records of occurrence. An 'accidental,' "to be worthy of a place on the State List," according to the author's excel-

[1] Check-List of California Birds. By Joseph Grinnell. Pacific Coast Avifauna, No. 3. Cooper Ornithological Club of California. Large 8vo, pp. 92, 2 col. maps.

lent standard, "must have been as a rule secured and preserved so that it can be re-identified whenever desirable." A glance through the Check-List shows that the list of duly authenticated accidentals is already quite large, not less than 25 species resting on a single record, and about as many more on only two or three records. It would have added greatly to the usefulness of this list if, in such exceptional cases, a reference to the place of record had been added.

While, "for the sake of convenience," the sequence of the A. O. U. Check-List has been followed, "the nomenclature has in several cases been remodeled to the best of the author's own knowledge." Thus, quite contrary to present tendencies, it is held by Mr. Grinnell "that actual geographical continuity in range accompanying corresponding intergradation is the criterion for the application of trinomials," etc. As this is the chief basis of his reformations in nomenclature, they appear to rest on the author's opinions and preferences rather more than upon his "own knowledge." There are thus, with perhaps two or three exceptions, no Old World birds which have subspecific representatives in North America. Also, quite a number of forms, as among the water birds, are given full specific rank in cases where the doubt, in the minds of many ornithologists of much longer experience, is whether the forms in question are entitled to any recognition in nomenclature. In other cases, where Mr. Grinnell's material and experience can hardly have supplied exceptional equipment for decisions, forms rejected by the A. O. U. Committee — which, while not infallible, contains some fairly good ornithologists — and sometimes by their proposers, are given recognition in the California Check-List. In some other cases, as some of the local forms of the State, Mr. Grinnell has doubtless abundant resources and ample experience, and his opinion is in such instances entitled to the highest respect.

The List consists (1) of the scientific and popular name of each form; (2) a list of the technical names by which the bird has been mentioned in the literature of California ornithology; and (3) its "status," or a statement of its "range, comparative abundance and season of occurrence," usually condensed into a sentence of one to three lines. "The range is usually expressed by Zones and Faunal Areas which are outlined in the accompanying maps." These maps are two in number, the first indicating by colored areas the 'Life Zones of California,' or the 'Isothermic Areas'; the second in a similar manner shows the 'Faunal Areas of California,' or the 'Isohumic Areas,' ten in number. "The areas differently colored on the maps have been outlined as accurately as the information at hand permitted; still the boundary lines must be considered provisional until the state is carefully surveyed zoögeographically." The maps are certainly a great convenience and help one to understand at a glance the complicated nature of climatic conditions in California. Respecting the names of his faunal areas (map 2) the author says, "Nomenclatural uniformity cannot be here attempted." These 'faunal areas' are in reality arbitrarily climatic rather than faunal, being based, as the subtitle of the

map indicates, on degree of humidity rather than on true faunal conditions — humidity and temperature combined. They thus do not correspond to areas commonly designated as 'faunal,' based on the peculiar association of species as determined primarily by temperature and secondarily, in most cases, by humidity. California offers an almost unique field for this sort of research, and it is gratifying to see that the subject is receiving so much attention.

A very full and satisfactory index, including all the names mentioned in the 'synonymy,' completes this very important and exceedingly useful contribution to California ornithology.— J. A. A.

Berlepsch and Hartert on the Birds of the Orinoco Region.[1]— This excellent memoir is based on collections made by Mr. and Mrs. George K. Cherrie in 1897, 1898 and 1899, on the Orinoco River, with much additional material collected by Mr. Samuel M. Klages, partly on the Caura River, and by Mr. E. André on the Nicare, a tributary of the Caura. The number of specimens thus available for study is not stated, but must be several thousand. The number of species and subspecies represented is 468, of which 8 species and 44 subspecies are described as new, as well as one genus. Localities and dates of collection are given, with notes on the color of bill, feet, iris, and 'soft parts,' as furnished by the collectors. There is also, *passim*, important comment on nomenclatural questions, the relationship of forms, etc. The memoir closes with some 'General Conclusions' (signed E. H.) on the faunal relations of the different parts of the region under treatment. Owing to the many difficulties presented, none of the collectors was able to reach "the unexplored tableland and mountain ranges forming the watershed between the basins of the Amazon and Orinoco Rivers, marked as the 'Sierra Parima' on the maps," which region hence still offers a tempting field for ornithological exploration.

In this connection the authors have done good service in attempting to fix type regions for the species described by previous authors from unknown, erroneous, or vaguely given localities. They have "in every case quoted the original description, which is the basis of our knowledge of each particular form," to which their citations are mainly limited, instead of including well known works, such as the British Museum 'Catalogue of Birds,' "where everybody knows that the bird is described or mentioned." "Where no locality is stated in the first description, or where the given locality is vague or erroneous, *we have added or substituted a sufficiently exact 'habitat'* as a starting-point. These additions and substitutes are not arbitrarily chosen, but always those that are the actual or the most likely ones whence the types have come, as apparent from the

[1] On the Birds of the Orinoco Region. By Count Hans von Berlepsch and Ernest Hartert. Novitates Zoologicæ, Vol. IX, 1902, pp. 1–134, pl. xii.

history of collections, from the travels of collectors, and the distribution of the various forms. Our substituted localities are therefore not only of value for the present work — inasmuch as they indicate that particular form with which we have compared, or tried to compare, the specimens before us, when deciding about their subspecific relations — *but we expect them to be accepted as the starting-point for future work* also." The acceptance, so emphatically insisted upon, must of course depend upon the merits of their ruling in each particular case; but, in most cases at least, their decisions appear to have been made with care and will doubtless meet with approval. As they truly say, if in separating an early composite species into its proper elements, errors sometimes made in taking a wrong form for the 'typical' one would be avoided if proper consideration were given to the subject of the original 'habitat.' They add: "If no such one is given, the first author who 'splits' the form up has the right to accept one; and this right we may logically claim in cases where we have not named a new form." This principle is so obviously sound, and is so widely followed, at least in America, that we are only surprised that it should be thought necessary to state the matter with so much insistence.

We quote further with pleasure the closing paragraph of Mr. Hartert's 'Concluding Remarks': "In nomenclatorial questions and orthography of names we have adhered strictly to priority, and although our ideas are not quite the same in every detail, we were able to agree in almost every case. This clearly shows that those who pretend that no finality can be reached in nomenclature[1] are quite in error. It is always the ignorance or disregard of the first publication, and the emendation of the spelling, that causes trouble, not the unsophisticated reference to and use of the earliest name as it was and is." This is assurance that the tendency is strong in favor of the strict enforcement of the law of priority and the non-emendation of names, so strenuously advocated for many years by the A. O. U. We are therefore not a little surprised to note on p. 129, apropos of *Parra* vs. *Jacana*, that these authors "refuse Brisson's names of genera, which are no genera in the Linnæan sense." Brisson's names were especially accepted by the original B. A. Code (1842), they antedating the XIIth edition of Linnæus, which this Code made the starting-point of the binomial system of nomenclature, and are now in current use by the greater part of both mammalogists and ornithologists. It is therefore to be hoped that for the sake of uniformity and harmony these authors will, on further consideration, waive their preferences in favor of accepting Brissonian genera. The objection that they are "no genera," in the modern sense, will apply quite as well to the currently accepted 'genera' of many other authors. — J. A. A.

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[1] "Some reviewers of modern zoölogical literature are especially fond of this vague statement."

Dubois's 'Synopsis Avium.'— Since our previous notice of this work Parts V–X have appeared, completing the first volume.[1] In the introduction the author states the purpose of the work to be to provide a simple manual which shall indicate for each species and subspecies the principal synonymy and the principal authors to be consulted. To have gone beyond this would have exceeded the end in view. He has, however, deemed it essential to add the habitat, and has given references in footnotes under the families to monographic works, when such exist, and to the British Museum 'Catalogue of Birds,' where good descriptions may be found.

He says he was unable to force himself to adopt any of the recent systems of classification, and has therefore followed, with slight modifications, that proposed by himself in 1891, in which the class Aves is divided into the two subclasses Gymnopædes and Ptilopædes, proposed by Sundevall. The system of Huxley is criticised as widely separating closely allied groups, and as bringing other groups into close juxtaposition which in reality have little in common. He agrees with Bonaparte, Milne-Edwards, and others in placing the Parrots at the head of the class, he considering them the most perfect of all birds in their organization. He says that from the intellectual point of view their superiority is incontestable: they have all the qualities and all the faults of the monkeys.

He recognizes subspecies, for which he employs a separate numeration from that of the species. The present volume includes his orders Psittaci, Scansores, Anisodactylæ, Macrochires, and Passeres, in the sequence named, of which he recognizes 53 families, 1357 genera, 9417 species, and 2477 additional subspecies. Of the "11898" species and subspecies included in his first volume, 4135 are represented in the Royal Museum of Natural History at Bruxelles. He says that he believes that a number of the recently described species and subspecies will be suppressed when they become better known, but he gives them place in order to attract the attention of ornithologists to these doubtful novelties.

As said in previous notices (Auk, XVII, p. 81, and XVIII, p. 121), the work will be a very useful one, and we trust will be successfully carried to completion. The twelve colored plates illustrate twenty-four previously unfigured or poorly figured species.— J. A. A.

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[1] Synopsis Avium | — | Nouveau | Manuel d'Ornithologie | Par | Alphonse Dubois | Docteur en sciences naturelles, | Conservateur au Musée Royal d'Histoire naturelle de Belgique, | Chevalier de l' Order de Léopold, | Membre du Comité international et permanent d'Ornithologie, | de la Commission permanente d'étude des collections du Musée de l' État Independant du Congo. | Membre honoraire, correspondant ou effectif de plusiers Sociétés savantes. | — | Première Partie | (1899–1902) | — | Bruxelles | H. Lamertin, éditeur | 20, Rue du Marché-au-bois | — | 1902.—Roy. 8vo, pp. i–xvi + 1–729, pll. col. i–xii.

'**Two Vanishing Game Birds.**'— Under this title [1] Dr. A. K. Fisher has made a strong plea for the protection of the Woodcock and the Wood Duck, at the same time pointing out the causes of their "impending extinction," and suggesting means for their preservation. "These game birds," he says, "differ materially in habits as well as in other particulars, but the conditions affecting their increase are very similar. As winter approaches they leave their summer homes, where they have been scattered over broad areas and gradually work southward until finally they become more or less concentrated in their respective haunts in the Southern States. Within the confines of this winter home, where no protection is afforded them, they are slaughtered in large numbers; and as the Southern States place little restriction on their export, they are shipped North in quantities limited mainly by the demands of the market or the endurance of the gunners. Not only are the birds subjected to this exterminating treatment throughout the winter, but when the season of migration comes and they return to their summer homes they fare little better; for a majority of the States in which they are found permit them to be shot while nesting or at the time when the young are unable to properly care for themselves. In view of these facts it is not surprising that the Woodcock, with its limited distribution and moderate fecundity, is very rapidly passing away, and that the Wood Duck has disappeared or become rare in many places where it was once common."

The distribution, habits, and natural enemies of these species and the part man plays in their destruction are considered, and 'preventive measures' are suggested for checking their decrease. In the case of the Woodcock, steps should be taken "to abolish all spring and summer shooting," and their protection in the Southern States in winter by the enactment and enforcement of proper laws for their protection, including a short open season, restriction of the size of the bag, and the prohibition of shipment for sale. If in addition there could be "a universal close season covering two or three years, the restoration of this noble bird would be assured."

The decline of the Wood Duck is considered in much the same manner, and similar measures are urged for its rehabilitation.

The paper is illustrated with drawings of each species by Mr. L. A. Fuertes, by a map showing the distribution of the Woodcock, and by a diagram showing the open and close seasons for each bird in the States and Territories, and the Canadian Provinces the species respectively inhabit. From these diagrams it appears that the Woodcock has no protection at any season in Delaware, Illinois, Kansas and Nebraska, nor in any of the Southern States except South Carolina, and Alabama, where

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[1] Two Vanishing Game Birds: the Woodcock and the Wood Duck. By A. K. Fisher, Ornithologist, Biological Survey. Yearbook of Department of Agriculture for 1901, pp. 447–458, pll. lxiii, lxiv. Also separate.

the bird is protected from April or May till October. For the Wood Duck there is a close season of greater or less length in Canada, in all of the Northern States except Kansas, in all of the Pacific States, but in only five of the thirteen Southern States. In a number of the Northern States and in several of the Provinces of Canada, the Wood Duck is protected from spring shooting. "If spring shooting," says Dr. Fisher, "be abolished the Wood Duck will gradually return to its old haunts and by degrees reestablish itself — to the joy and satisfaction of all lovers of nature."— J. A. A.

Job's 'Among the Water-Fowl.' — The title[1] of this interesting work very fully indicates its general character, that of a 'popular narrative' from personal study of the birds in their haunts, with photographs of the birds and their nests from nature, obtained often at the expense of considerable hardship and risk. The matter is arranged under five subheadings, as follows: 'Part I. The Submerged Tenth: Grebes and Loons.' 'Part II. Modern Cliff-Dwellers: Gannets, Guillemots, Auks, Puffins, Kittiwakes, etc.' 'Part III. Ocean Wanderers: Shearwaters, Jaegers or Skuas, Petrels, Phalaropes.' 'Part IV. The White-winged Fleet: Gulls and Terns.' 'Part V. Wild Fowl of Wild Fowl: Ducks and Geese.'

As is well known to a wide circle of ornithologists, Mr. Job is indefatigable in his pursuit of the wild fowl, and patient almost beyond measure in his work with the camera under varied and trying conditions, and his liberal mead of success, both as an observer and in bird photography has been well earned. His field of work includes the lakes and marshes of North Dakota, the islands of the St. Lawrence, and the off-shore waters of the Atlantic coast, from Massachusetts to Nova Scotia, besides the ordinary fields and inland waters of the northeastern States and southeastern Canada. He here lays before the reader in the form of a simple narrative the results of his years of exploration and experience with the varied tribe of wild water fowl, from Grebes to Ducks, Geese and Phalaropes. Aside from its interest to the bird-lover, his 'Among the Water-Fowl' is an important contribution to the life-histories of many species none too well-known, and the most difficult to investigate, owing to the inaccessibility of their haunts, and the special preparation and long journeys necessary to reach them and successfully cultivate their acquaintance.

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[1] Among the Water-Fowl: Observations, Adventure, Photography. A popular Narrative Account of the Water-Fowl as found in the Northern and Middle States and Lower Canada, east of the Rocky Mountains. By Herbert K. Job. Profusely illustrated by photographs from Nature, mostly by the Author. New York: Doubleday, Page & Co. 1902. Square 8vo, pp. xxi + 224, with numerous half-tone cuts and plates. Price, $1.35 net.

The half-tone pictures, nearly one hundred in number, add immensely to a clear conception of the breeding haunts and habits of a large number of species the ordinary observer can hardly hope to be able to study in life. — J. A. A.

Witherby on the Migration of Birds.[1] — Mr. Witherby sets forth at some length, in a popular way, many well-known facts about bird migration. "None of the many theories" professing to answer the questions of what causes migration, what first led birds to migrate, and how they find their way, are, to him, in any way satisfactory; "the more," he says, "we study the matter, and the more we learn, the more difficult does it become to adopt any of the theories, fascinating and plausible though many of them are." But he believes that the collecting and sifting of information, now going on, "will lead us almost imperceptibly towards the discovery of this mystery of mysteries"! When discovered, what an aching void there will be for those who love mysteries! — J. A. A.

Shufeldt on the Osteology of the Psittaci.[2] — The views of several leading authorities on the classification of the Psittaci are quoted at some length (pp. 399–405), and then follows an account of the osteological characters of the Carolina Paroquet, this part of the paper being a revision, with some additions, of his paper on the same subject published in 1886, to which is added (pp. 419, 420) 'Observations upon the Osteology of the Owl Parrot (*Stringops habroptilus*). The nine figures forming the four half-tone plates represent the skeleton of *Stringops* and the skulls of *Conurus carolinensis*, *Ara militaris*, and *Cacatua galerita*, and the trunk skeletons and some other bones of *Conurus* and *Cacatua*, the sternum and shoulder girdle of *Calyptorhynchus*, and the humeri of *Cacatua*. — J. A. A.

Strong on the Metallic Colors of the Feathers of the Neck of the Domestic Pigeon.[3] — The so-called metallic colors and iridescent effects of feathers have been generally explained as diffraction phenomena. Dr. Strong states that the hypothesis based on the supposed presence of striæ and ridges is "inapplicable to this case when one finds that the feather may be rotated through a whole circle with essentially the same color effects for given angles even from individual barbules. Furthermore, a careful microscopic study of the barbule surface shows that irregularities

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[1] The Migration of Birds. By H. F. Witherby, F. Z. S., Member of the British Ornithologists' Union. Separate, pp. 16, reprinted from 'Chambers Journal.'

[2] Osteology of the Psittaci. By R. W. Shufeldt. Annals Carnegie Museum, Vol. I, 1902, pp. 399–421, pll. xxi–xxiv.

[3] The Metallic Colors of Feathers from the Neck of the Domestic Pigeon. By R. M. Strong. Biolog. Bull., Vol. III, 1892, pp. 85–87.

such as striæ, ridges, pits, knob-like elevations, etc., are not frequent enough when sufficiently small to produce grating effects, and in fact are not normal occurrences."

The colors of the feathers, he says, when observed without a microscope, are evidently mixed colors. "The greenish effects are produced when light strikes the broad surfaces of the barbules and is reflected with a small angle of reflection. The reds appear only when light falls with a large angle of incidence on the pigment granules of a margin or elevated portion of a barbule. We seem to have a clear case of Newton's rings where each pigment granule comes in contact with the outer transparent layer."

This preliminary statement will be followed by a more detailed account, illustrated with figures. — J. A. A.

Mearns on Three New Birds from the Southern United States.[1] — These are a new Grasshopper Sparrow (*Coturniculus savannarum floridanus*) from southern Florida, where it is the resident form; the Florida Purple Martin (*Progne purpurea floridana*), and a new Nuthatch (*Sitta carolinensis nelsoni*) from the southern Rocky Mountains.— J. A. A.

Oberholser on New South American Birds.[2] — Mr. Oberholser has described in the present paper one new genus and 13 new species and subspecies of South American birds, mainly from specimens in the U. S. National Museum, but in part based on material from the American Museum of Natural History. Mr. Oberholser also expresses his views of the proper arrangement of the *Thryophilus leucotis* group, of which he recognizes ten species and subspecies.— J. A. A.

Oberholser on Birds from Paraguay.[3] — The collection of birds here reported upon "consists of 78 specimens, representing 65 species and subspecies, several of which," says the author, "appear to be unrecorded from Paraguay." Among these were seven species and subspecies which Mr. Oberholser, in the paper noticed above, introduced to science as new, and here redescribes in greater detail. Mr. Oberholser also discusses at length the nomenclature and relationships of quite a number of the species here under notice.— J. A. A.

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[1] Descriptions of Three New Birds from the Southern United States. By Edgar A. Mearns, Major and Surgeon, U. S. Army. Proc. U. S. Nat. Mus., Vol. XXIV, No. 1274, pp. 915–926.

[2] Some New South American Birds. By Harry C. Oberholser. Proc. U. S. Nat. Mus., Vol. XXV, No. 1276, pp. 59–68.

[3] List of Birds collected by William Foster in Paraguay. By Harry C. Oberholser. Proc. U. S. Nat. Mus., Vol. XXV, No. 1281, pp. 127–147, 1902.

Chapman on Birds from Alaska.[1]—The 68 species here listed were obtained on the Kenai Peninsula, Alaska, from June 21 to August 15, and on Popof Island, one of the Shumagin group, October 19–26 and November 10 to December 5, 1901, by the Andrew J. Stone Expedition of 1901, collecting in the interest of the American Museum of Natural History. The list is annotated by Mr. Chapman, and includes field notes by the collector, Mr. J. D. Figgins. The White-tailed Ptarmigan of the Kenai Peninsula is separated as a new subspecies, under the name *Lagopus leucurus peninsularis*. The Kenai form of the Steller's Jay is distinguished as new under the name *Cyanocilta stelleri borealis*. Incidentally the Hudsonian Chickadees are reviewed at some length, with the result that four forms are recognized, as follows: (1) *Parus hudsonicus*, (2) *P. h. littoralis*, (3) *P. h. stoneyi* and (4) *P. h. columbianus*. The Kenai specimens are referred to *P. h. columbianus; littoralis* was described many years since by the late Dr. Bryant from Nova Scotia specimens.—J. A. A.

Shelley's 'Birds of Africa.' Vol. III.—We take great pleasure in chronicling the appearance of Volume III of Captain Shelley's great work on the 'Birds of Africa',[2] the plan and scope of which has already been placed before the readers of 'The Auk.'[3] The present volume treats of 158 species, and includes the Motacillidæ, the Alaudidæ, and the Fringillidæ. The 14 colored plates illustrate 28 species. All the praise bestowed upon Volume II is equally merited by Volume III. As the first two volumes include only 354 species, or about one eighth of the total number given in the 'List' as published in Volume I, the serious magnitude of this great undertaking is evident.—J. A. A.

Bertoni's 'Aves Nuevas del Paraguay.'[4]—This is the unassuming title

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[1] List of Birds collected in Alaska by the Andrew J. Stone Expedition of 1901, by Frank M. Chapman. Bull. Am. Mus. Nat. Hist., Vol. XVI, pp. 231–247, Aug. 18, 1902.

[2] The | Birds of Africa, | comprising all the Species which occur | in the | Ethiopian Region. | By | G. E. Shelley, F. Z. S., F. R. G. S., etc. | (late Grenadier Guards), | Author of "A Handbook to the Birds of Egypt," | "A Monograph of the Sun-Birds," etc. | — | Vol. III. | — | London: | Published for the Author by | R. H. Porter, 7, Princes Street, Cavendish Square, W. | 1902. —4to, pp. x + 276, col. pl. xv–xviii.

[3] Auk, Vol. XVIII, 1901, pp. 122, 123.

[4] Aves Nuevas del Paraguay | Continuación á Azara | por | A. de Winkelried Bertoni | (Extracto de la Historia Natural de las Aves | del Paraguay) | — | Descripción de las especies nuevas descubiertas por el autor | y contribuciones al estudio de la | avifauna Paraguaya | — | Materiales recojidos desde 1890 hasta fines de 1900. | — | Asunción | Talleres Nacionales de H. Kraus | Enero de 1901. | 8vo. pp. 1–216.

of a paper, apparently reprinted from the 'Anales Científicos Paraguayos,' which contains more than 30 new generic names, one new "family," and 104 new species and subspecies. This remarkable paper, although published at the beginning of 1901, does not yet appear to have been noticed in the ornithological journals, for which reason a brief account of it is here given. The supposed new birds were collected by the author, mainly in the region of the 'Alto Paraná,' between the years 1890 and 1900, part of which time was spent in their determination at the Museo de la Plata.

While the author refers to collections made in Paraguay in recent years (Rohde, 1885; Borelli, 1893), and to the determination of Azara's species by Berlepsch, it is nevertheless evident that his knowledge of the present status of the ornithology of that country is very slight indeed.

The present paper consists mainly of descriptions of supposed new genera and species, in continuation of Azara's work, to which is added a catalogue of the birds of Paraguay (513 species). The descriptions are very full, and a study of them will doubtless enable ornithologists to decide just where Señor Bertoni's names belong. For the present a mere list of these names must suffice. This is as follows:

Prionochilus ("Mergidæ"),
P. brasiliensis,
Ardea paranensis,
Penelope purpurescens,
P. p. major,
P. olivacea,
Zenaida virgata,
Chamæpelia miantoptera,
C. plumbea,
Pteroglossus attalorhynchus,
Trogon splendidus,
Megacephalus ("Trogonidæ"),
M. bitorquatus,
Microtrogon ("Trogonidæ"),
M. fulvescens,
M. galbuloides,
Geophilus ("Cuculidæ"),
G. jasijatere,
Brachyrhamphus ("Corvidæ"),
B. elegans,
Campephilus rufifrons,
Dendrobates guttatus,
Ara chloroptera major,
Phæthornis paraguayensis,
Cephaloepis apirati,
Trochilus chlorobronchus,
Chlorostilbon cyanothorax,
Calliphlox microptera,
Rhamphomicron Melchtalianur,
Lampornis Musarum,
Aërornis ("Cypselidæ"),
A. niveifrons,
Xiphocolaptes paranensis,
Dendrocolaptes tarefero,
Campylorhamphus ("Dendrocolaptidæ"),
D. longirostris,
Acanthurus ("Dendrocolaptidæ"),
A. microrhynchus,
Picolaptes Koeniswaldianus,
Hydrolegus ("Dendrocolaptidæ"),
H. Silvestrianus,
Xenops argobronchus,
Synallaxis furvicaudatus,
S. cururuvi,
Barnesia (Subgenus of *Synallaxis*; type, *S. cururuvi*),
Phacellodomus Bergianus,
Geoœcia ("Dendrocolaptidæ"),
G. orryctera,
Agelæus ruficollis,
Ostinops Cherrieanus,
Coccothraustes Ambrosettianus,
Spermophila aurantiirostris,

Pyrorhamphus ("Fringillidæ"),
P. Berlepschianus,
Bergia ("Fringillidæ"),
B. Solanorum,
Diplochilus ("Tanagridæ"),
D. xanthochlorus,
Calliste septemcolora,
Euphonia aurantiicollis,
E. cyanoblephora,
E. Berlepschiana,
E. Egusquizæ,
Chelidoramphidæ, ("fam. nova")
Chelidorhamphus [Procnias !],
C. orhycterus,
Pipra Morenoana,
Psaliurus ("Laniadæ"),
P. Acevalianus,
Hadrostomus Borellianus,
Tityra tephronota,
Climacocercus ("Cotingidæ"),
C. cyanocephalus,
Berlepschia ("Tyrannidæ"),
B. chrysoblephara,
Ceraphanes ("Tyrannidæ"),
C. anomalus,
Copurus subniger,
Myiarchus Stauffacherianus,
Elainea Arechavaletæ,
E. Holmbergiana,
Phylloœcia ("Tyrannidæ"),
Phylloœcia chloroleuca,
Hapalocercus albifrons,
H. plumbeipes,
Hemitriccus Salvadorianus,
H. Barberenæ,
Serphophaga cinnamocephala,
Hylocentrites ("Tyrannidæ"),
H. ambulator,
Myiophthorus ("Tyrannidæ"),
M. Morenoanus,
Euscarthmus minutus,
Renggerornis ("Tyrannidæ"),
R. leucophthalmus,
Phyllopneuste flavifrons ("Vireonidæ"),
Thamnophilus leuconotus,
T. Lahilleanus,
T. flavescens,
Silvestrinus (subgenus of *Thamnophilus*; type, *T. flavescens*),
T. Rodriguezianus,
Dendroœcia ("Thamnophilidæ"),
D. erythroptera,
Formicivora rubricollis,
F. Arechavaletæ,
Stipituropsis (type, *F. Arechavaletæ*),
Phyllobates ("Thamnophilidæ"),
P. erythronotus,
Polioptila melanocephala,
Certhiola palmarum,
Turdus tephromelas,
T. metallophonus,
Chamæza tshororo ("Chamæzidæ"),
Chamæbates ("Chamæzidæ"),
C. rufiventris,
Spizaëtus apirati,
Micraëtus ("Accipitridæ"),
M. Holmbergianus,
Potamolegus ("Accipitridæ"),
P. superciliaris,
P. s. magniplumis,
P. s. furvicollis,
Rupornis nigra,
Accipiter virgatus,
Thrasyaccipiter ("Accipitridæ"),
T. seminocturnis,
Gampsonyx ranivorus,
Elanus amauroleucus,
Hypotriorchis melanogyne,
Rostrihamus tenuirostris,
Nyctale Bergiana,
N. fasciata,
Syrnium Koeniswaldianum,
S. Borellianum,
Strix Holmbergiana,
Glaucidium ferox rufus.— C. W. R.

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CORRESPONDENCE.

The Extra-illustrated Edition of 'Baird, Brewer and Ridgway.'

EDITORS OF 'THE AUK':

Dear Sirs:—The Academy of Natural Sciences of Philadelphia recently became the possessor of a copy of Baird, Brewer, and Ridgway's 'A History of North American Birds. Land Birds,' which differed from the one already in its library by having in addition to the sixty-four plates of bird-heads, thirty-six plates, each containing a full-length figure.

These extra plates are colored and were lithographed by Robert Ridgway, one of the joint authors, and represent the following species[1]: *Turdus mustelinus, Turdus migratorius, Galeoscoptes carolinensis, Sialia sialis, Thryothorus ludovicianus miamensis, Helminthophaga leucobronchialis, Dendroica æstiva, Dendroica cærulea, Dendroica blackburniæ, Dendroica virens, Helminthophaga lawrencii, Pyranga rubra, Carpodacus rhodocolpus, Chrysomitris tristis, Leucosticte atrata, Ammodromus nigrescens, Zonotrichia albicollis, Junco hyemalis, Melospiza melodia, Euspiza americana, Hedymeles ludovicianus, Cyanospiza cyanea, Cardinalis virginianus, Dolichonyx oryzivorus, Icterus baltimore, Cyanura cristata, Antrostomus vociferus, Trochilus colubris, Sphyropicus thyroideus, Melanerpes erythrocephalus, Conurus carolinensis, Scops asio floridanus, Glaucidium ferrugineum, Speotyto floridanus, Falco richardsoni, Scardafella inca.*

While the existence of an edition of this work with these plates may be known to many ornithologists, yet there is no printed record of such, as far as the present writer is aware. No mention of these plates is made in Coues's 'Bibliography,' nor in the several reviews of the 'Land Birds' to which I have had access. Dr. C. W. Richmond informs me that Mr. Ridgway has never seen a copy of the work with these plates although he has some loose plates in his possession.

This work was published by Little, Brown, and Company, and from their catalogue there seems to have been two editions — one with 64 plain plates, the other with 64 colored plates, "and 36 additional plates of full-length figures beautifully colored by hand." There is still another colored edition without the 36 additional plates. It is quite likely that the original issue consisted of two editions, colored and plain, without extra plates, the latter edition appearing some time later.

WILLIAM J. FOX.
The Academy of Natural Science of Philadelphia.

In Re Meleagris sylvestris Vieillot.

EDITORS OF 'THE AUK':

Dear Sirs: — My attention has been called to a rather ill-natured attack on Mr. Ogilvie-Grant, by Mr. J. A. Allen, which appears in your Journal for July, 1902, p. 311. Will you allow me to inform the "unenlightened American ornithologists" that Mr. Grant's citation of *Meleagris silvestris*, Vieill. is perfectly correct as Nouv. Dict. d'Hist. Nat. IX, p. 447 (1817). That it is spelled with an *i* instead of a *y* does not appear to me to be of the slightest consequence. The reason that Mr. Allen and his friends cannot find *silvestris*, but do find *fera*, is due, I suspect, to the fact that they are not using the original edition of the IX Vol. (1817) of the Nouv. Dict. (ed. 2), but the Vol. IX which contains the reprinted leaf pp. 447,

[1] The names are as they occur on the plates and are in sequence, as the plates are not numbered.

448, which is signatured "IX *." and which duplicated lines which appeared on the previous page.

I am, Sirs, yours truly

C. DAVIES SHERBORN,
"*Index Animalium*."

Sept. 6, '02.

[It gives me pleasure to offer my best thanks to Mr. Sherborn for the information he has given the "unenlightened American Ornithologists" respecting the reprinted leaf comprising pp. 447, 448 of Vol. IX, Nouv. Dict. d' Hist. Nat., nouvelle édition, 1817, signatured "IX *." As Mr. Sherborn suspects, this is the edition of this volume, and the only one, I have consulted in this connection, and it is also the one used by Mr. Elliot. Apologies are therefore due, and are here cheerfully rendered, to Mr. Grant in respect to the citation in question.

It remains to note that if the name *fera* replaces the name *sylvestris* in the reprinted leaf, *Meleagris sylvestris* of course antedates *Meleagris fera*, so that the Wild Turkey of the Eastern United States will have to stand, from the American point of view, as *Meleagris gallopavo sylvestris* (Vieill.). — J. A. ALLEN].

Unsatisfactory Records.

EDITORS OF 'THE AUK':—

Dear Sirs: — It is with reluctance that we offer any criticism of labor which results in so much pleasure and profit as the editing of 'The Auk.' For some time, however, it has seemed to us that a stricter censorship of items for the 'General Notes' would result in a much more satisfactory standard in that department. Many interesting birds have lately been recorded, as seen, not shot, by observers whose capacity for accurate observation is absolutely unknown to ornithologists in general. Some of these records seem to bear on their face evidence of error. There appeared, for instance, in 'The Auk' for July, 1902, p. 297, a list of arrivals in the Northern Adirondacks. The author lists the White-eyed Vireo, and records its arrival from April 25 to April 30. There is no mention of the Solitary Vireo in the list. This seems enough to arouse suspicion. When one notes further that the date of the arrival of the Wilson's Thrush is given as from April 20 to April 25, nine days earlier than the date given in Chapman's 'Handbook' for Sing-Sing, N. Y., and that the Hermit Thrush does not appear in the list, it seems surprising that the list should have been printed without the least editorial comment.

We would respectfully suggest that no record of a bird merely observed, where there is any chance for error, be accepted, unless the observer be well known to the editor, or to some ornithologist of standing and judgment, who will vouch to the editor for the accuracy of the observer.

Yours respectfully,

WILLIAM BREWSTER,
RALPH HOFFMANN.

Cambridge, Mass.

NOTES AND NEWS.

DR. JAMES G. COOPER, a Corresponding Member of the American Ornithologists' Union, died at Haywards, Alameda County, California, July, 19, 1902, at the age of 72 years. He was born in New York City, June 19, 1830, and was the oldest of six children. His grandfather, James Cooper, an English merchant, settled in New York soon after the close of the Revolution, where he died in 1801, after having accumulated a comfortable fortune. His father, William Cooper, was born in 1798; he early decided to devote himself to the study of natural history, and at the age of nineteen became one of the founders of the Lyceum of Natural History of New York, now the New York Academy of Sciences; in 1821 he sailed for Europe, to continue his studies in zoölogy, where he attended the lectures of Cuvier in Paris, and was elected the first American member of the London Zoölogical Society. He was later secretary of the New York Lyceum, and was prominently identified with the notable group of naturalists who soon made the Lyceum prominent among the scientific institutions of America. He was the friend of Audubon and Nuttall, and a correspondent and co-worker of Lucian Bonaparte, editing the last two volumes of his 'American Ornithology.' Bonaparte, in appreciation of his friendship and assistance, named for him the hawk now known as *Accipiter cooperi*, described from specimens taken by Cooper in Hudson County, N. Y. He also collected the type and only known specimen of the sandpiper, *Tringa cooperi*, named in his honor by Baird.

Thus James G. Cooper, the subject of the present sketch, was reared and educated under surroundings especially favorable for the development of his inherited scientific tendencies. In 1851 he was graduated from the New York College of Physicians and Surgeons, and spent the following two years in the city hospitals. In 1853 he was appointed surgeon to the northern division of the Pacific Railroad Survey, under the direction of Brevet Captain George B. McClelland, at the instigation of Professor Baird. After serving in the field as surgeon and naturalist for about one year, he returned to Washington to prepare his report. He was soon forced, however, by poor health to seek the more favorable climate of the Pacific coast, where he devoted three years to making collections, most of the time at his own expense, during which period he not only continued his work in the Northwest, but collected also in southern California, and made a trip of three months southward as far as Panama. In 1857 he was appointed surgeon to the expedition under Lieut. Mullan to survey a Wagon Road from Fort Kearney to the Pacific, but the expedition was abandoned when it had reached the Rocky Mountains in Montana, and Dr. Cooper then went on a collecting trip to the Mojave Desert. In 1860 he was again a contract surgeon, and was detailed to accompany troops across the continent from New York to Fort Columbus, Department of Oregon. During the following three years he was engaged in collecting

and in field exploration in southern California, including both the coast and the interior as far east as Fort Mojave. In 1864 he was commissioned Assistant Surgeon in the Second Cavalry, California Volunteers. On being mustered out, at the close of the Civil War, he served as naturalist to the Geological Survey of California. In January, 1866, he was married to Miss Rosa M. Wells of California, and soon settled down to the practice of his profession, which, in 1871, he was obliged to abandon in consequence of failing health. In 1875 he moved to Haywards, California, where he subsequently resided.

Dr. Cooper was throughout his life greatly handicapped by poor health, and for a considerable period was dependent upon his medical practice for support; yet his scientific activity extended over a long period, and embraced a wide field, although his chief work was in ornithology and conchology. His best known ornithological publications are his 'Report on the Birds collected on the Route near the 47th and 49th Parallels' (jointly with Dr. Suckley, in Pacific R. R. Rep. of Expl. and Surv., Vol. XII, part ii, pp. 140–291, 1859), and his 'Ornithology of California' (Land Birds, royal 8vo, 1870, edited by Baird). In 1869 he published a paper of much interest entitled 'The Fauna of California and its Geographical Distribution' (Proc. Calif. Acad. Sci., Vol. IV, pp. 61–81), and in the same year a series of papers on 'The Fauna of Montana Territory,' (Amer. Naturalist, Vols. II and III). His contributions to the literature of conchology are far more numerous than his papers relating to other subjects.

In his field work Dr. Cooper was an 'all-around' naturalist, collecting not only birds, mammals, insects, and shells, but extensively in botany, so that many departments of natural history are indebted to his intelligent labors. As already intimated, his field work and his writings relate almost exclusively to the natural history of the Pacific coast region of the United States; and in recognition of his ornithological services the ornithologists of California have very appropriately named their organization 'The Cooper Ornithological Club,' and have published as the first article of the Club's 'Bulletin' (Vol. I, 1899, pp. 1–5) a portrait of Dr. Cooper and an extended sketch of his life, written by Mr. W. O. Emerson, to which we are mainly indebted for the biographical facts above given.[1]

Alonzo M. Collett, an Associate Member of the American Ornithologists' Union, died at his home in Denver, Colorado, August 22, 1902, from typhoid fever, at the age of 33 years. He was born in Indiana, and

[1] Since the above was sent to the printer we have received the September–October number of 'The Condor,' in which Mr. Emerson adds an 'In Memoriam' to his previous biography of Dr. Cooper, and Mr. Joseph Grinnell adds a list of his ornithological writings, which number 26 titles.

when a youth of seventeen moved with his parents to Kansas, and entered the Kansas Normal School at Emporia, from which he was graduated in 1890, and where he remained for two years as an instructor. He then became a laboratory assistant in the department of botany at Harvard University, where he remained for two years, and then took the position of teacher of natural sciences at East Denver High School, Colorado. "The subjects which he taught here were zoölogy, physiology, botany and physical geography, besides a small but enthusiastic volunteer class in biology. Aside from his uniform success as a teacher, Prof. Collett had a way of endearing himself to his students by his ready sympathy in everything which interested them." He achieved considerable success as a collector and taxidermist, but appears to have published very little relating to ornithology.

CLARENCE H. MORRELL, an Associate Member of the American Ornithologists' Union since 1895, died at his home in Pittsfield, Maine, July 15, 1902, after a lingering illness of nearly two years duration. He was born at Pittsfield, Me., February 23, 1872, and at an early age showed a preference for nature study. While botany and other branches of natural history claimed much of his attention, he had a deeper interest in the birds. While in the Maine Central Institute as a student, he assisted in teaching the classes in nature study, and was recognized as an authority on birds. Later he devoted all of his spare time to natural history pursuits, and wrote extensively on such subjects for the local newspapers and for many of the bird magazines. He became an active member of the Maine Ornithological Society soon after its organization, and was chosen editor of its 'Journal,' but lack of time compelled him to resign the editorship on the completion of the first volume. He continued his interest in the 'Journal' and in the work of the Society, being one of the faithful few through whose efforts the activity of the society was maintained.

In his field work he was careful and conscientious, and anxious that all his records should be beyond question. His series of Maine Warblers 'sets' is among the finest ever gotten together. Although one of the few holding a permit from the Governor of the State to collect birds, nests, and eggs for scientific purposes, he very rarely shot a bird, except with his ever-ready camera. His chief delight was to row his boat up the pond to his favorite haunts and carefully photograph the birds and nests which he found there. The writer was frequently his companion on these trips, and many happy hours have we spent together among the birds. His quiet, gentle disposition, his manliness, and his deep love of the beautiful endeared him to all who knew him; and in his death science loses a sincere worker, and his friends and co-workers a friend whose loss will long be felt. — J. M. SWAIN.

THE PUBLISHERS, Houghton, Mifflin, and Company (Boston and New York), announce for early publication Mrs. Florence Merriam Bailey's

'Handbook of Birds of the Western United States.' "This book is intended to do for the western part of the United States what Mr. Frank M. Chapman's 'Handbook' has done for the East." It has been prepared on similar lines, and will contain "over six hundred illustrations, including thirty full-page plates from drawings by Louis Agassiz Fuertes."

Such a work has long been needed, and its preparation could hardly have fallen into better hands. The price is stated to be $3.50 net, postage extra.

MR. RALPH G. MILLS, of 356 West Decatur St., Decatur, Illinois, is investigating the parasitic habits of the American Cowbird, and desires information concerning their eggs. In a letter to the Editor of 'The Auk' he states that he desires data respecting "the exact size of the one or more Cowbird's eggs in each nest, the size of each of the eggs of the host, the name of the host, and any additional facts of interest." In publishing the results of his investigations Mr. Mills will give due credit for any assistance rendered him.

THE U. S. Department of Agriculture has just issued, as 'Farmer's Bulletin No. 160,' a digest of the 'Game Laws for 1902. A Summary of the Provisions relating to Seasons, Shipment, Sale and Licenses,' prepared by Dr. T. S. Palmer and H. W. Olds, assistants on the Biological Survey. "The object of this bulletin is to meet a general demand for information on game laws by presenting briefly the most important regulations concerning the shipment and sale, especially those governing interstate commerce in game.... It is believed that the matter presented in this report, although greatly condensed, will prove useful not only to sportsmen and wardens but also to dealers, shippers, farmers, and others interested in game." By means of maps and tables the information is presented in an exceedingly convenient form. Map 2 (p. 30) shows that only four States — Kentucky, Mississippi, Montana, and Virginia — permit the exportation of game. Map 3 (p. 40) shows that the southern Provinces of Canada and about three fourths of the States and Territories prohibit the sale of certain kinds of game at all times; some of these permit the sale of certain kinds of game during the open season and for a certain number of days immediately thereafter, as shown in the explanatory table accompanying the plate. All of the Southern Provinces of Canada, and all of the Northern States except Idaho, and Arkansas, Florida and South Carolina of the Southern States, require nonresidents to obtain hunting licenses, the fee for which varies from $5 to $50 in the different States and Provinces. Tables show at a glance the close seasons for all kinds of game in the United States and Canada. A gratifying and encouraging feature of this exhibit is the increasing strenuousness of laws for the protection of game, and the wide-spread legislative interest in the subject.

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ERRATA.

Page 28, line 8, for **gambelli** read **gambeli**.

Page 88, line 2, for ***philadelphia*** read ***philadelphicus***.

Page 89, line 18, for ***philadelphia*** read ***philadelphicus***.

Page 234, line 13, for **Cordeiles** read **Chordeiles**.

Page 289, lines 10 and 11, for "it sounds like *red-dy*, sometimes — but not by any means generally. He gives," read: "it sounds like *red-dy*. Sometimes, but not by any means, generally, he gives."

For additional errata see bottom of page 314.

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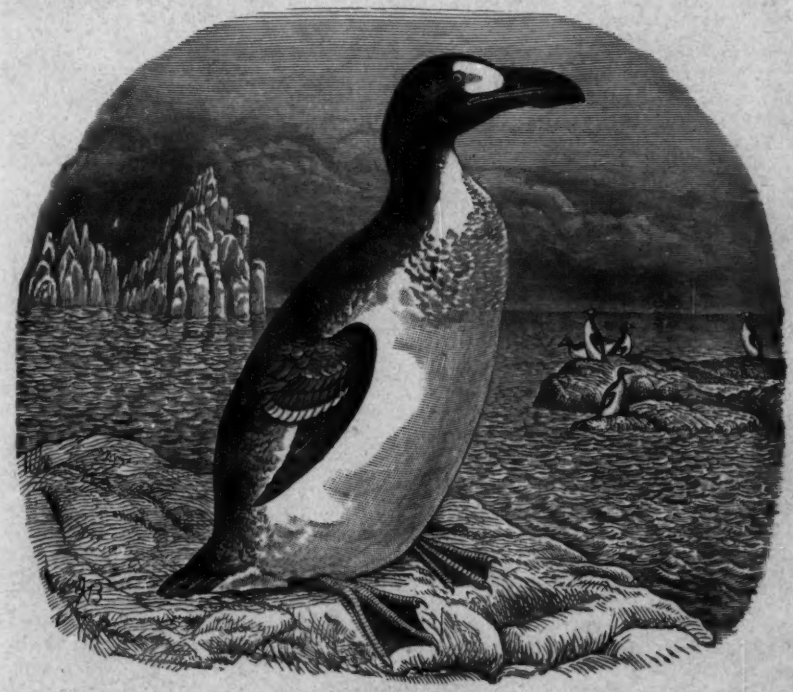

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